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AN

# HISTORICAL SKETCH

OF THE PROGRESS OF

# THE ART OF WAR.

BY

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DEDICATED

TO

LIEUT. GEN. SIR SAMFORD WHITTINGHAM,

K.C.B. AND K.C.H. &c. &c. &c.

COMMANDER IN CHIEF OF THE WINDWARD

AND LEEWARD ISLANDS,

A LIEUT.-GENERAL IN THE SPANISH ARMY,

KNIGHT OF THE ROYAL MILITARY ORDER

OF MERIT, OF SAN FERNANDO,

BY

HIS VERY GRATEFULLY OBLIGED FRIEND,

THE AUTHOR.

30133





## P R E F A C E.

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WHEN a military writer offers the result of his labours to the judgment of his brother soldiers, and the public, people very naturally ask, is this person a man of great experience, or has the service he has seen been such as to enable him to form correct opinions, based on his own individual knowledge of warfare? It grieves me much that I cannot give, what might be deemed a satisfactory answer to these questions. The humble knowledge which I possess, is indeed gleaned from the writings of the ablest and most renowned warriors ; but unhappily my trifling experience is confined to peaceable battalion or brigade field-days ; the evolutions and manœuvres, in which I have been exercised have taken place within reach of comfortable cantonments ; the heaviest fires of the regiments to which I have

belonged, during my service with them, have been directed with blank cartridge upon the pestiferous malaria of Bengal, a dangerous enemy no doubt, but one in combatting with whom, little honour is to be gained. “*Je baisse les pas des vieux soldats, je pleure au recit de leurs combats, je suis consumé par le desir d’en voir, et par la honte de ne’n avoir pas vu encore.*” I am most anxious to acquire such experience as my veteran brother officers possess ; and I have always been delighted to hear from them, and to treasure up the valuable lessons so many of them have learned, during long and honorable service. However, the nature of the little work which I now venture to publish is not such as absolutely to require in the author of it, personal experience in actual service. The history of ancient warfare is perhaps as difficult to be understood by the modern veteran soldier, as by him who has never seen a battle-field. The weapons, the tactics, of ancient warriors present to the view, features totally different from what are seen in our armies ; and therefore the man of slight experience may, perhaps, on those points, form as correct a

judgment, as he who possesses a great measure of that valuable quality. But I have offered no opinions on any debateable subjects ; I have merely studied the history of the warfare of all ages, attentively (as far as my opportunities of so doing allowed) ; and in this sketch I have endeavoured to trace out distinctly its progressive improvement.

In the course of my military studies I have always been in the habit of taking notes of what I read ; and at a period before I entered the army, when I had no profession or regular occupation whatever, it occurred to me that I might occupy my time usefully, in giving an embodied form to the scraps of information which I had casually collected from the works of various authors. This was done in an hasty and desultory manner ; but still the attempt produced a tolerably connected sketch of the progress of the military art.

In my first efforts to acquire an acquaintance with the military profession, I had often severely felt the want of some introduction to a course of studies, setting forth and explaining the rise and gradual advance of the science ; and in my

further progress, I found a reference even to the rough and crude sketch before alluded to of singular advantage. I have since shown that sketch to more than one distinguished and scientific soldier ; and had strongly hoped that it might suggest to one of them, the idea of composing a perfect work of the kind ; but high and important duties had pre-occupied talents really well qualified to fulfil the object which I have feebly, and perhaps rashly, endeavoured to attain. But, in excuse for such boldness, I must urge, that a very celebrated officer advised me to enlarge and improve the original rough sketch upon which this work is based ; and encouraged me to hope that the publication might prove acceptable to the profession, and useful to young military students.

Some authors of military works think it always necessary to apologise to the public for the deficiencies of their style, and Othello-like, to excuse their being “rude in speech,” because they are soldiers. This appears to be extremely absurd from the members of a profession which ranks in its numbers the highest and best educated classes

of society, and which can boast of many very elegant writers, and excellent historians. I neither would, nor could offer such an apology for the inelegance of my style, of which I am quite as conscious as any of my critics can be.

I would not try to excuse my own deficiency by ridiculously casting a slight on a profession which I so much glory in belonging to ; I could not do so with truth ; for I have, as a student, walked the courts and halls of an university, long before I ever saw the white canvass of a camp, or marched with measured pace upon a parade ground.

The many defects, therefore, of my manner and mode of writing must be attributed either to my own natural want of ability or the defective, monkish and antiquated nature of my scholastic education, and not to the influence of camps or barracks.

But I must beg the reader's indulgent consideration of the many disadvantages I have laboured under in the prosecution of my undertaking ; having at an early age left Europe some years ago for a country where there is very



great difficulty in procuring books of reference, and for a climate most unfavourable to study or active exertion.

These circumstances have prevented my attempt from being as successful as it might, perhaps, otherwise have been. Nothing should have induced me to undertake the task, but a conviction of the utility of a work of this nature; and as I knew of no competent person who had leisure or inclination to engage in it, the advice of my friends has influenced me in making the attempt.

In conclusion, I may be permitted to observe, that the reader of general history will, I hope, derive useful information from this work, as well as the military student. To many persons, accounts of campaigns, battles, and sieges, (which hold so large and important a share in the history of every nation,) present nothing but a confused mass of incomprehensible facts. The popular nature of this historical sketch is such that the general reader, who may peruse it, will find the path of his studies, in many places, enlightened and cleared of difficulties and obscurities.

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The Author having been at a distance from the press, the following errors have escaped, which the reader is requested to correct with his pen :

#### ERRATA.

Page 9, Fourth line from bottom, for Thymbra *read* Thymbraëa.

— 10, Eleventh line, for M. Annius *read* Manius.

— 13, Fifteenth line, for Thymbra *read* Thymbraëa.

— 41, Tenth line, insert "after ground."

— 50, Fourth line, omit *the* before Armenia.

— 59, Sixteenth line, insert *a* before chanfrain.

— 64, Tenth line, insert "before the knights."

— 66, Seventh line, for shafed *read* shaped.

— 94, Ninth line, for Simiezovitez *read* Simienowicz.

— 95, Seventh line, insert "at the beginning of paragraph.

— 102, Sixth line, insert *masonry* ; after of.

— 112, Seventh line, *read* ricochet.

— 160, Eleventh line, for fought, *read* fight.

Twenty-second line, for critical movements, *read* critical moments.



AN  
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THE ART OF WAR.

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THE Art of War, of the very simplest nature conceivable in its first commencement, has gradually gone on improving until it has at length become of all arts one of the most complicated in theory, and one of the most difficult in practice, as it is incontestably the noblest and most glorious of all others on account of the vast and incalculable importance of its results. In the early ages of the world, when mankind were in a primitive state of ignorance and barbarism, or, at the present time, amongst the uncultivated savages of the remoter quarters of the globe, the military art is a mere exercise of personal prowess and dexterity in the use of the rudest weapons; whilst amongst the civilized nations of the modern world it is an art which requires, in those who practise its highest branches, the most extensive acquirements and the most superior mental and moral qualifications.

But, in the long and tedious progress from its rude beginnings to its present highly improved and almost perfected state, this art must, of course, have undergone numerous changes and various modifications. An historical sketch of such progress must indeed be highly interesting to every intelligent and inquiring mind, and it cannot fail to be peculiarly so to the military student. To him it may prove of extreme utility in elucidating many subjects, which, without certain historical information, must appear vague and obscure, or perhaps altogether unintelligible. Without a close acquaintance with the history of Britain, it would be difficult, perhaps impossible, for our legislators rightly to understand the nature and spirit of our institutions, and in like manner the modern soldier will obtain a less obscure view of the genius of our warfare, by tracing its various steps towards improvement. Many may, perhaps, object to what I have here advanced, alleging that the nature of military science has been so entirely altered by the invention of gunpowder, the change in our weapons, and other mechanical causes, that no reference to past times can be of any use to the soldier of the present day. The best reply to such objection will be in the words of that distinguished writer the Baron de Jomini, "Il a existé de tous temps des principes fondamentaux sur lesquels reposent les bonnes combinaisons de la guerre, et auxquels



on doit toutes les rapporter pour juger de leur veritable merite."

"Ces principes sont immuables, independans de l'espèce d'armes, des temps, et des lieux. Le genie et l'experience indiquent les variations dont leur application est susceptible."

To trace the operation of those sublime principles in the success or defeat of armies, cannot surely be useless; and their truths must be carried home to the student's mind with the more firm conviction, when he observes that they have been always invariable, although the practice of the art has varied, in varying situations, ages and climates.

It is true, that the influence of mechanical causes, in military affairs, has been very great, and particularly that of the invention of gunpowder; but, notwithstanding, I think, it will be allowed, after a calm and close examination of general history, that the progress of the art of war has kept a pretty equable pace with the general advance of civilization and knowledge. Amongst remote barbarians, on whom the light of science has not yet dawned, we find this noble art, even in our own day, in the same rude state in which it existed in the infancy of the world; while those nations of antiquity, who had attained to a certain rank in the scale of civilization, had also carried the practice of warlike science to a high degree of excellence and beauty. With a few modifications, the same may be observed

of the practical application to the purposes of life, of all sciences. The enormous and expensive aqueducts of the ancients, constructed for the purpose of supplying their towns with water, are striking monuments of their ignorance of the science of hydrostatics; while the more enlightened moderns effect the same purpose in the simplest manner, and at comparatively trifling expense—because, in the latter days, the physical sciences have been more carefully and more generally studied, and their principles more successfully investigated. In like manner, the military ignorance of the ancients, (excepting, always, those classic nations, of whom we shall hereafter speak,) was the cause of their practical inferiority to the moderns, who have gradually arrived at a closer and more intimate acquaintance with the true principles and correct practice of war, appropriating to themselves, by the aid of history, the collective experience of many ages and many climates.

It is not the object of my labours to present the reader with a universal military history, neither would it be possible to do so within the proposed limits of this work—my purpose is already sufficiently explained, and I shall endeavour to attain it, by relating the various alterations and improvements which have taken place at different periods, in the weapons—the fortifications—the tactical arrangement—and the practice of campaigns, and



battles, amongst those nations with whose history we are best acquainted. And that this object may be the more simply and easily effected, we shall divide this Historical Sketch of the Progress of the Art of War, into three æras—the first, from the creation of the world, to the fall of the Roman empire—the second, the period of the middle ages—and the third, from the time of the invention of gunpowder to the present day.

## FIRST ÆRA.

THE first mention made, in Sacred History, of a regular action between two armies, is of that which was fought in the vale of Siddim,<sup>a</sup> about the year 1913 before Christ; but there is no account of the manner in which they fought, nor the species of weapons with which the combatants engaged on that occasion. We may, however, infer that the arms were most probably pointed with iron, as even the antediluvians were acquainted with the workmanship of metals—and a certain man, Tubaleain, is spoken of as “instructor of every artificer in brass and iron.” In this battle the slaughter of the King of Sodom, and his allies, must have been very great, judging both from what is related of his defeat, and also, from the observed results of similar engagements amongst savage nations in the present day, whose state of existence very much resembles that of the tribes of the Gentiles, who are spoken of in the book of Genesis. I have been informed, by a person of credit, who was for fifteen months a captive in one of the Society Islands,

<sup>a</sup> Genesis, chap. 14.

that he witnessed a fight between two savage tribes, each about three hundred strong. The object of contention was a small beetle garden, and the engagement took place on a very circumscribed space; each man was armed with a club, and a knife, a javelin, and a kind of demi-quoit, which is hurled with great force and dexterity. The fight was obstinate, and at its conclusion nearly one half of the combatants lay dead or dying—for their wounds were not of that nature which could be cured by their unskilful chirurgeons. Such must, in general, have been the description of the combats of the early inhabitants of the earth, as their arms were very similar to those used by savages in the present day. The least reflection on this circumstance will shew the absurdity of the declamations of certain false sentimentalists, who affect to lament over the invention of gunpowder, and other improvements in the Military Art; whereas, the most inattentive perusal of the history of warfare, will clearly bring to light that such improvements have a manifest tendency to diminish the expenditure of human life in war. The very first step towards improvement, namely, the adopting of defensive armour, was productive of this desirable effect; but, it is not in our power to fix the precise date of this invention. Homer's account of the armour of the warriors engaged in the Trojan war, (about the year 1193 before Christ,) is the earliest we meet with in pro-

fane history, to which the smallest degree of credit can be attached. As soon as the Israelites elected kings to rule over them, who had the power to maintain regular and permanent bodies of troops, we find that they adopted defensive armour, such as helmets and coats of mail, formed either of scale work of brass or hammered iron, together with shields and bucklers.

In these early ages, the infantry was always esteemed the principal part of the armies, except amongst such nations as the Scythians or Numidians, who dwelt in great plains, and led a wandering life. The use of cavalry is supposed to have originated from the circumstance of horses having been first employed for the purpose of transport, and their strength and vigour being thus conspicuously displayed, it naturally occurred to their masters that their powers might, with facility, be applied to the purposes of war. For the same reasons, the natives of the East were induced to mount their warriors on camels and elephants, and at last even to construct chariots of war. The horse was ridden and managed by a single cavalier, armed with various kinds of missive weapons—on the camel were placed two men back to back, and armed with bows and arrows—and on the elephant was erected a kind of tower, filled with archers. Most commonly one warrior and his charioteer were accustomed to occupy a chariot of war, to

which sometimes were attached sharp scythes, projecting laterally from the car. But as these inventions, as well as camels and elephants, could only be used on even and extensive plains, they were never very generally adopted in Europe. Chariots were always in great esteem amongst the ancient people of Asia, and some were even constructed capable of holding six warriors. They were often so numerous in their armies, as to be reckoned by thousands; and it is related in the 13th chapter of the first book of Samuel, that the Philistines brought up thirty thousand chariots against Samuel. However, the Jews, whose military constitution was far superior to that of the surrounding Asiatic nations, were by no means favorable to the extensive use of these warlike machines; for we find that Solomon reckoned only <sup>a</sup> fourteen hundred armed chariots in his numerous forces. But the younger Cyrus was the first Asiatic Prince who discovered that a large quantity of these machines impeded the movements of an army, and that they were ineffectual against good troops, and therefore, he considerably reduced their number, and at the battle of Thymbra, reckoned only three hundred.

About the same period, or four hundred years before Christ, according to Xenophon, the custom

<sup>a</sup>. 1st Kings, chap. 10, verse 26.



of mounting archers on camels appears to have been decreasing amongst the more warlike Asiatics. But the effeminate people of India, China, &c. have continued the practice, with some modifications, even to the present day. Camels were rendered useless in action by the same means, which were afterwards employed by the Romans, against the elephants of Pyrrhus, king of Epirus. Plutarch relates, how, at the battle of Beneventum, when one wing of the Romans were retiring before these animals, the Consul M. Annius Curius <sup>a</sup> “called for those troops who were left to guard the camp, who were fresh and well armed. These, as they descended from their advantageous situation, pierced the elephants with javelins, and forced them to turn their backs, and those creatures, rushing upon their own battalions, threw them into the greatest confusion and disorder.” Thus, it may be observed, that these large animals, so formidable in appearance, were found more mischievous to their friends than their enemies, when brought into action against brave and skilful soldiers. In fact, except for a short period, by the Macedonians, they were never much esteemed by any of those nations of antiquity, which merit the title of warlike, as the Jews, Greeks, or Romans—whose manner of practising the art of war it shall now be our object to review.

<sup>a</sup> Plutarch's life of Pyrrhus.

The Jews were a most warlike people, and their kings always kept on foot a standing army, part of which formed a body guard, while the remainder was distributed along the frontiers. Their defensive arms were targets, helmets, and coats of mail, of scale-work of brass or hammered iron—their offensive weapons were the sword and a kind of halberd, which they sometimes threw at their enemy—they had likewise in their armies many archers and slingers. It would appear that the Jews excelled in the use of the sword; for the destruction and slaughter made by that weapon was so proverbial, that to be “smitten with the edge of the sword” is spoken of in the scriptures as one of the most terrible judgments inflicted by divine wrath.

By the Mosaic law, every Israelite on attaining his twentieth year was judged fit for war, and classed and registered in his <sup>a</sup> tribe. The tribes were divided into bodies of one thousand men each, and these again into halves, which were likewise subdivided into companies of one hundred men each; this arrangement was first adopted by the advice of Jethro, Moses’s father-in-law, for <sup>b</sup> judicial purposes, and was ever after continued in their military constitution. From their being thus organized into small bodies, we may conclude that the Hebrew troops were not accustomed to engage in

<sup>a</sup> Numbers, chap. 1, verse 3.

<sup>b</sup> Exodus, chap. 18.

very great depth, and from the circumstance of slingers and archers being always attached to their armies, it might naturally be inferred, that their light and heavy troops were accustomed to be so disposed in action as mutually to support and assist each other. But all this is merely speculation, for we have no authentic account of any regular system of supports and reserves having been established amongst the Jewish forces.

Although their method of warfare, when compared with the standard of modern tactics, or that of the Roman Legion, may appear rude and unskilful in the extreme; still the moral organization of the Hebrew armies was excellently well adapted to the circumstances of the nation, as will be evident from a perusal of the twentieth chapter of Deuteronomy. It is there enjoined, that such persons as had built a house, planted a vineyard, or betrothed a wife, within the year, should be exempted from military service; and further, that, on preparation for war, the officers should command any man who felt himself fearful or faint-hearted, to "go and return unto his house, lest his brethren's heart faint as well as his heart." The soldiers of Israel conquered their numerous enemies, because they were impressed with a firm belief that Divine Providence aided their endeavours. The bravest, of a naturally brave and able-bodied race of men, fought the battles of their nation, relying on heaven, their



own courage, and the sword, which is the best of all weapons for individual combat.

It has been asserted by some writers, that the Jews borrowed part of their military discipline from the Egyptians; but this notion is merely founded on the circumstance of the Israelites having been so long in captivity in Egypt, and nothing can be further from the truth. Herodotus informs us that the Egyptians used large shields which covered them from head to foot, very long pikes and short swords; whereas the targets of the Jews were small, their halberds of moderate length, and their swords long. The Egyptians were accustomed to form in bodies of immense depth, and Xenophon relates, that at the battle of Thymbra they were drawn up in square battalions of ten thousand men each, one hundred in front and as many in depth. Now, the formation of the Jewish troops, as we have already had occasion to remark, was entirely of a contrary nature. However, the moral<sup>a</sup> constitution of the Egyptian troops was of a very excellent description; for the education of the soldiers commenced in their boyhood, and discipline was maintained more by the promise of reward than the dread of punishment: the laws made the profession of arms respectable, and so well was the comfort of the soldiers provided for, that every man was

<sup>a</sup> Herodotus, Liber 2.

allowed half an acre of land free of taxes, besides a daily allowance of five pounds of bread, two of meat, and a pint of wine. Notwithstanding, the rank they held amongst the military nations of antiquity was very low, owing to the vice of a tactical formation, which cramps all the energies of men and takes away the possibility of making the least movement without confusion and derangement of ranks.

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There existed a great variety in the mode of practising the military art amongst the ancient Greeks; and, indeed, few subjects have ever created more angry discussions between learned tacticians than the nature of the Grecian discipline. Wedges, orbs, triangles, rhombs, and geometrical orders of battle have been treated of with all that violence and heat which is usual with disputants, who are not thoroughly acquainted with the subjects on which they argue. The merits and demerits of the phalanx have afforded a fine field for the display of classical enthusiasm and erudite blundering. But, if the history of the wars of the Greeks be read carefully, and with a judgment unbiassed by party prejudice, it will appear that the term phalanx is most commonly applied to the main body of the

heavy armed infantry of the army ; or separately to the main body of each particular state, which furnished its quota of troops to a confederacy, as the phalanx of the Lacedemonians, of the Eleans, of the Arcadians, &c. The Spartans never formed their phalanx of greater depth than twelve men ; but other states were accustomed to draw up eighteen or even twenty deep.

The renowned Macedonian phalanx was first raised by King Philip, to be kept on a permanent footing, and consisted of six thousand heavy armed men : it was afterwards augmented to twelve or fourteen thousand by his son Alexander. It has been erroneously supposed by many, that Philip was the inventor of the large phalanx of sixteen thousand men, which in truth never existed but in the imagination of tactical writers. *Ælianus* gives a long and minute account of a phalanx of this nature, its doubling and undoubling of files, &c. ; a description of which would be as uninteresting as tedious, and especially as the whole of it has already been attempted in France in the reign of Louis the Fourteenth, and has proved difficult in execution and devoid of utility. We shall, therefore, confine ourselves to what is plain and authentic in the writings of *Ælianus* relative to the Grecian tactics.

The real phalanx was so disposed, preparatory to the attack, that on coming to the charge, the

sacrissæ or pikes of even the seventh or eighth rank should project beyond the front of the body, thus bringing as great a number of weapons as possible to bear upon the point of attack. This arrangement being well imagined, and based upon the correct principles of war, was formidable in the extreme upon a level plain, where nothing occurred to interrupt the advance or cause disorder; but on ground in the slightest degree intersected, it is obvious that such clumsily formed bodies could not for a moment preserve their compactness in movement.

The wedges, lozenges, and other fantastic formations treated of by the Greek tacticians, were most probably never employed on actual service, and in fact, the learned of the present day differ much as to the precise meaning of those terms in the original.

It is certain, however, that there were three distinct species of Greek infantry, the Oplites, the Peltastes, and the Psilites. The Oplites, or heavy armed, (of whom the phalanx was composed,) wore helmets, breast-plates of hammered iron, with greaves on their legs, large shields of wood or folds of bullocks' hides covered with plates of copper or brass, and they carried pikes and short swords. Iphicrates, general of the Athenians, about the year 357 before Christ, made considerable alteration in these respects, diminishing the size of the shields,



substituting flaxen armour (which must have resembled the quilted sabre-proof jackets now used in Asia) for the iron plastrons or breast-plates ; and increasing the length both of the pikes and swords. The Peltastes were more lightly armed, and had shorter weapons than the first species of infantry, carrying small round targets, from which they derived their name. The Psilites were the light infantry, who wore no defensive armour, and were variously armed with darts, arrows, and slings.

This division of their infantry was a very judicious arrangement ; for their light armed foot could skirmish with and harass the enemy, performing all sorts of detached duties, and, when supported by the Peltastes, were capable of preventing any small parties of the enemy from annoying the main body of heavy-armed infantry on their march. Xenophon relates an example of the excellence of this disposition, when the ten thousand Greeks, on their celebrated retreat, were opposed in their passage through the country of the Carduæ. The heavy infantry was divided into as many as eighty distinct bodies, who advanced up the mountains, their intervals being covered by the light armed, protecting those little battalions from hostile slingers and archers, and in their turn receiving support from the solid bodies. But notwithstanding these advantages of the Grecian discipline, we shall hereafter observe the inferiority of their system of

supports and reserves to that of the Roman Legion, the Phalanx being too unwieldy to have any support within itself, and its want of flexibility of movement having a strong tendency to cramp every kind of operation except the simple advance on a level plain.

The Greek republics were at first too poor to maintain any cavalry; chariots having been abandoned as useless after the Trojan war.

Afterwards they attempted to organize a few; but the Thessalian cavalry was always esteemed the best, and was in general hired by such states as required any. It is remarkable that the Greek, as well as every other cavalry, were originally nothing more than horse archers, employed on the same principle as the archers who were mounted on camels and elephants. But, in process of time, heavy horsemen were armed with lances and large swords, and clothed in coats of mail, iron helmets and buskins, with small targets. When scouring a country the horse were accustomed to move in dispersed order; but for action they were formed in squadrons of one hundred and twenty eight men each. This body, which was called *epilarchy*, was commonly arranged on a front of twelve or thirteen, and on a depth of ten; so that from a want of elasticity of formation, its manœuvring must have been slow, stiff, and constrained. The Ottoman cavalry, in the present

day, are accustomed to a similar order; and consequently are unable to meet the cavalry of any Christian power, although it is supposed by some, that a Turkish spahi is individually superior to any cuirassier in Europe, on account of his superior horsemanship. But a troop of horse formed in great depth is incapable of active manœuvre, and the exertions of the men in the rear ranks are completely paralysed; as they can neither use their weapons against the enemy, nor can the rearmost horses add any thing to the momentum and impetus of the charge of the front rank, as it might be expected the rear divisions of a column of infantry would do.

There were never any great actions performed by the Grecian cavalry; but the glory of their heavy infantry is established on an immortal basis. Even now, at the distance of so many centuries, the never-dying names of Marathon, Leuctra, Mantinea, and Thymbræa, excite the warmest feelings of admiration for their heroes, even in the breasts of those cold sentimentalists, who affect to call glory an empty name. When we read of the advance of Xenophon's companions at Thymbræa, striking their pikes against their shields, and singing the soul-stirring Pœan, and of the total overthrow they gave to the countless hosts of Persian cavalry, we are almost tempted to think that nothing on earth could surpass this gallant body of Greek

infantry. But in a calm and dispassionate examination of a scientific question, we must divest ourselves even of this natural, this laudable enthusiasm. That Roman infantry, whose valour and discipline subdued the then known world under the dominion of a petty Italian state, may well compete for the prize with the Greek Phalanxes ; and we shall now, therefore, endeavour to give a clear and succinct account of their discipline, weapons, tactical arrangement, and method of warfare.

If we be surprised at the victories of the Greeks over the innumerable armies of Asia, and at the enormous conquests of Alexander's Macedonians, extending from the Hellespont to the Hydaspes, how much greater homage must we render to the glory of the immortal Roman legions. They conquered those very Greeks who were their superiors in learning, and in those fine arts which adorn civil life ; they conquered the Germans, Gauls, and Spaniards, who were all superior to them in stature and positive bodily strength, and at least equal to them in courage ; and they also conquered the Carthagenians, who were incomparably the most subtle and cunning of men in all sorts of warlike stratagems. This unvarying success can only be attributed to the super-excellence of their moral and tactical organization, and to the unwearying attention paid to the education and training of the soldiers ; as well as to the genius of those great



commanders, who led them in their glorious career. The military student will derive much advantage from acquainting himself with the moral constitution and government of their troops, in which points it must be confessed, both they and the Greeks far excelled even ourselves.

Into the legion none were admitted but free citizens, from the age of seventeen to forty-five, of whom each man had his own portion of land, in the cultivation of which he must, of course, have become accustomed to those agricultural labours, which are so well calculated to fit a man for the endurance of the hardships of war. The possession of landed property also gave the soldier a personal interest in the defence of the commonwealth. The profession of an agriculturist and a soldier were found not at all incompatible ; but as war was justly esteemed the most honorable of all occupations, the training of the Romans commenced from their very infancy. For this purpose, in the beginning of the commonwealth, a Campus Martius, or field for warlike exercises, was set apart near the city, in which the boys were trained to running, leaping, wrestling, and throwing the bar ; and after their fatigues, they were accustomed to bathe and swim in the Tiber. Thus Rome had always in cultivation a nursery of healthy young recruits, accustomed to manly exercises, and eager to try their growing vigour against the enemies of their country.

Their education did not cease after enlistment into the legion, but they were then taught the use of the pilum or javelin, and of the sword. In all the process of training, the soldier used a helmet and sword double the weight of the common ones ; so that taking the field against the enemy was rather a relaxation from the fatigues of ordinary duty, than otherwise. They were very frequent in the practice of the evolutions of the legion, into a minute detail of which we shall not here enter. But it may be remarked that, in their manœuvres, it was of so much importance that every man should know the exact number of his file, and the names of his right and left hand men, that they were used to be engraven on his helmet and buckler. Historians relate that they frequently practised sham battles, in order to accustom the young soldiers to what they should really have to do on service. Idleness was so much dreaded by their generals, that, when the troops had no other occupation, they were employed by them in making roads, many of which exist to the present day. In this practice the moderns have sometimes very properly imitated the Romans. It is remarkable, that in so many campaigns, made in so many various climates, we seldom hear of the Roman armies suffering much from disease, and this can only be accounted for from the circumstance of the soldiers being kept in a healthful state of body, by constant and regular exercise.

The strictest discipline and habits of obedience, were inculcated, and the punishments for the breach of military law were often frightfully severe. We find the Consul Manlius, in the war with the Latins, putting his own son to death, for conquering in a manner which was contrary to orders ; and, on occasions where whole bodies of troops behaved ill before the enemy, it was by no means an uncommon practice to put every tenth man, drawn by lot, to death, which dreadful punishment was called decimation. But, on the other hand, some generals governed by different means, and Fabius Maximus ruled his soldiers chiefly by lenity and kindness. In the words of Plutarch, he “thought it hard, that while those who breed dogs and horses, soften their stubborn tempers, and bring down their fierce spirits by care and kindness, rather than with whips and chains, he who has the command of men should not endeavour to correct their errors by gentleness and goodness, but treat them even in a harsher and more violent manner than gardeners do the wild fig trees, wild pears and olives, whose nature they subdue by cultivation, and which, by that means, they bring to produce very agreeable fruit.” This amiable and at the same time philosophical doctrine of the great Fabius, is exemplified by a well-known anecdote, which it may not be displeasing to the reader for me to bring to his recollection

in this place : <sup>a</sup> “ Another time some of his officers informed him that one of the soldiers, a native of Lucania, often quitted his post and rambled out of the camp. Upon this report he asked, what kind of man he was in other respects ? and they all declared it was not easy to find so good a soldier—doing him the justice to mention several extraordinary instances of his valour. On inquiring into the cause of his irregularity, he found that the man was passionately in love, and that for the sake of seeing a young woman, he ventured out of the camp, and took a long and dangerous journey every night. Thereupon, Fabius gave orders to some of his men to find out the woman and convey her into his own tent, but took care the Lucanian should not know it,—then he sent for him, and taking him aside, spoke to him as follows—‘ I very well know that you have lain many nights out of the camp, in breach of Roman discipline and laws—at the same time I am not ignorant of your past services—in consideration of them, I forgive your present crime ; but, for the future, I will give you in charge to a person who shall be answerable for you.’ While the soldier stood much amazed, Fabius produced the woman, and putting her in his hands, thus expressed himself : ‘ This is the person who engages

<sup>a</sup> Plutarch's Life of Fabius Maximus.



for you, that you remain in camp, and now we shall see whether there was not some traitorous design which drew you out, and which you made the love of this woman a cloak for.' ”

The character of the Roman army was, of course, greatly influenced by their system of promotion, and this was in its nature extremely singular, and in their state of society admirably calculated to promote good discipline and subordination, and general advantage to the service.

In the first place, the soldiery being divided in three classes, the honor of being allowed to pass from the junior, or inferior, to a superior class, was a great incitement to good conduct in the men. With regard to the officers, they of a superior grade chose those who were to serve in the next inferior rank to themselves. To explain this—the people, or state, elected the consuls or commanders-in-chief, they again chose out the military tribunes, who commanded legions—they also appointed the centurions, who were the officers that commanded maniples or companies—and these last chose their own subalterns or tergiductors, whose duty was to close up the rear, as do the serre-file ranks of our modern battalions. It is very obvious, how, under such a system, merit must have been the chief, if not the only passport to advancement, for the personal character of a consul was deeply concerned in the choice he might make of the military tribunes

to command the different corps under his orders ; and he would naturally seek to have his own fame and honor, and his own plans and dispositions in war, supported and carried into effect by the valour and ability of officers of distinction. In like manner, a military tribune was deeply interested in the selection of gallant, prudent and skilful centurions to command the maniples of his legion, and so on to the junior ranks of officers. This system of promotion, which establishes such a beautiful chain of subordination and attachment between the inferior and superior officers, could most probably never be applied to a modern army, on account of the difference of our manners and state of society ; but its principle might and ought so far to be adopted as to leave to every general-in-chief the selection of his own generals of division, and to these again the choice of their own divisionary staff, whether personal or general. Thus, in each command, the principal officer would be surrounded by men whom he knew, and in whom he had confidence, and in whose respectability his own character for judgment or penetration would be very much concerned.

The Roman infantry was recruited from amongst the plebeians or commons, and the cavalry from the patricians or aristocracy. Romulus, the founder of their city, divided the foot into three classes—namely, the Hastati, who were the youngest and most



active, though least experienced soldiers, and were so called from *hasta*, the Latin word for a kind of short javelin, with which, in the beginning, they were armed—secondly, the *Principes*, who were men of a more advanced age and robust constitution; and lastly, the *Triarii*, who were the oldest and most practised veterans, in whom the dependance and confidence of the general was placed, and who formed the grand reserve of the legion. At different periods slight alterations took place in the arms of these different sorts of infantry; but, as they were generally all alike, we shall first proceed to examine the nature of those arms, offensive and defensive, which were longest in use, and we shall afterwards explain the tactical formation of the troops.

The legionary soldiers were provided with helmets of brass, plastrons or breast-plates of hammered iron, a foot square, and oblong shields, which, according to Polybius, were four feet long by two and a half in breadth. The richer citizens who entered the legion, as well as the officers, were usually clothed in the *lorica hamis conserta*, or *hamata*, which was a coat of mail made of leather, covered over with plates of iron or brass in scale-work, or of iron rings, twisted within one another, in the form of chains. They had also greaves on the legs. The offensive weapons were two iron-pointed stakes or *pila*, the one nearly six feet in length, the other about four feet and a-half; both

of which they were accustomed to hurl at the enemy ; but occasionally they used the longer pilum for the purpose of striking. At one period the Triarii, or corps of reserve, carried pikes twelve feet long ; but afterwards all the heavy infantry were armed alike with the pila. In the Cimbrian war, Marius made an alteration in the pilum, which was considered an improvement.—Formerly the head had been fastened to the wood by two iron pins ; he drew one of them, which he replaced by a weak wooden peg : so that if the pilum should strike an enemy's shield, the wooden peg breaking, and the handle of the pilum trailing along the ground, the enemy would thereby be so much embarrassed as to be forced to abandon his shield. Every foot soldier was armed with a wide two-edged sword of Spanish origin, which was only two feet in length, and worn on the right hip. This most formidable weapon, being adapted both for cutting and thrusting, was always in great repute amongst the Romans, and was found capable of much execution.

In the early days of the Commonwealth, little account appears to have been taken of any light infantry. In process of time, however, a force of light infantry, called Rorarii, was recruited from the lowest of the people. These troops were afterwards supplanted by the Velites, who wore no defensive armour, except a light round target, of three feet

in diameter, and a sabre-proof leather casque for the head. Their offensive weapons were the sword and seven hastæ or darts, very light, the wood of which was three feet long, and an inch thick. The iron point at the end of the hasta was four inches in length, and tapered so very finely, that it could not strike without breaking: by this contrivance it was impossible for the enemy to return the darts.

Such were the Velites, the celebrated Roman light infantry, properly so called. The term Velites, in a general sense is often applied to the light infantry of their auxiliary troops, whether armed with bows, slings or javelins. The Sagittarii, or bowmen, whom we find to have contributed greatly to the success of battles, were in the beginning composed of their allies from the petty Italian states, which they subdued under their authority. As the commonwealth increased they hired archers from Crete, which island was from the earliest antiquity famous for the skill of its inhabitants in the use of the bow. In both the Roman and Carthaginian armies, the celebrated slingers of the Balearic islands were employed and held in great estimation. It is surprising with what skill many ancient nations used this rude weapon: for it is related that some slingers were able to hurl stones with such velocity and violence as to break strong shields, helmets, and breast-plates. The Romans themselves never were remarkable as good light troops: for this species of

force they relied almost entirely on their allies and hired foreigners.

The first cavalry of ancient Rome was a select body raised by Romulus, and trained to fight on horseback or on foot. They were in the beginning called *Celeres*, either on account of the great rapidity of their movements, or from the name of their first commander, Fabius Celer. They were clothed very lightly, and were supplied with no defensive armour, but a light target of bullock's leather. The name of *Equites* or horsemen was afterwards applied to them, and none but patricians were admitted into the service. Their weapon of offence was a very slender lance, which after the first Punic war, was considerably strengthened; at the same time they adopted coats of mail and iron helmets. About the same period also, their numbers were much <sup>a</sup> increased, and ten *turmæ* were joined to every legion. These *turmæ* or bands consisted of thirty-two men each, drawn up four deep. It is probable the *turmæ* of the Roman *Equites*, owing to their lesser depth of formation, were superior to the unwieldy *epilarchies* of the Greeks; but still they were very contemptible cavalry. We find that at the battle of *Cannæ*, Hannibal's Spanish and Gaulish horse, in the very first onset, drove the Roman Knights with great slaughter into the river. In all

<sup>a</sup> T. Liv. Liber 8.



Cæsar's campaigns, wherever any remarkable action of cavalry is mentioned, it may be observed, it was always by the Spaniards or others of his allies. However, the nature of this arm was not at all understood by the ancients. Their horse appears merely to have played the part of skirmishers and foragers. Indeed, the simple fact, that they were ignorant of the use of the stirrup is enough to shew what miserable troops the cavalry of the ancients must have been.

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It is time now to speak of that celebrated tactical formation of the Roman troops, to which in a great degree they owed so many of their victories. The mode of arraying the infantry was at first in a single line, with reserves in rear, and this method continued until after the war with the Veii. The new arrangements, which were then adopted, are very clearly explained in the eighth book of Livy. The legion, in order of battle, was drawn up in three lines, the first composed of manipuli, or companies of Hastati, which preserved between each other distances equal to their fronts; the second composed of companies of Principes, placed in rear of the intervals of the first line; and the third line consisting of companies of Triarii in reserve. In



each legion of the Roman army there were ten manipuli of Hastati, ten of Principes, and the same of Triarii. These manipuli or companies varied in strength, but commonly mustered one hundred and twenty men each in the Hastati and Principes; and half that number in the Triarii. They were drawn up in a depth of ten, and each soldier in order of battle occupied a space of six Roman feet, that he might have sufficient room to use his weapons conveniently. Their ordinary method of attack was for the first line running up to throw their pila and draw their swords; and if repulsed, to retire and rally behind the Principes, who charged in their turn or in conjunction with the Hastati. While the two first lines thus mutually supported each other, the veteran Triarii remained in reserve, kneeling to avoid the enemy's missiles, awaiting the critical moment, when a grand result should be reaped by their advancing to a decisive charge.

While the above order of battle continued to be used, the most ordinary proportion of the different species of troops in a legion was as follows:—twelve or fifteen hundred Hastati, as many Principes, half that number of Triarii, twelve hundred Velites, and three hundred and twenty Equites. The post of the Equites was on the wings, and the Velites were distributed in front, flank and rear, according to circumstances and the discretion of the general.

It is certain that the custom of arraying the foot

in three lines of maniples with open intervals, or the quincunx order, as it is sometimes called, was adopted immediately after the taking of Veiaë, or in the year 394 before Christ, and that it endured at least until after the battle of Pydna, where Paulus Æmilius defeated Perseus, the king of Macedon; which event took place in the year 166 before Christ. It is supposed by many that Marius altered this formation, and drew up the legion in a continued line; but as Marius at all events did not enter on the Cymbrian war till the year 102 before Christ, the quincunx order of battle must have been the established one for about three hundred years. The battle of Pydna was the most decisive trial between the rival formations of the phalanx and legion. The manipuli of the first line could make no impression on the close front of the Macedonians bristling with pikes. A Pelignian centurion, enraged at his want of success, flung the standard of his company amongst the enemy, calling on his soldiers not to suffer the disgrace of its loss. In vain did they throw themselves upon the enemy, endeavouring to cut through their pikes, or turn them down. They were repulsed in great confusion; but the Macedonians in the eagerness of pursuit, and owing to the unevenness of the ground, became broken in several parts along their whole front. Then appeared the great beauty of the legionary system of supports and reserves within

itself; for Æmilius observing the interstices in various parts of the enemy's line, ordered the manipuli of the second line to throw themselves into those openings, and thus taking the broken portions of the phalanx in flank, they had good opportunity of using their excellent swords to advantage; while others, as Plutarch observes, "fetched a compass and attacked them in rear." Those others must, of course, have been the Triarii, or grand reserves of the legion. Very much on the same principle, Æmilius' son, Scipio, afterwards conquered the great Hannibal, at the battle of Zama, which was fought about the year 144 before Christ.

Cæsar's legions consisted of ten cohorts each, and some suppose they were drawn up in a single line. But this appears to me to have been contradicted by Cæsar himself, in the relation he gives of his arrangements preparatory to the battle of <sup>a</sup> Pharsalia. He speaks of having charged the whole army, and particularly the third line, not to advance to battle without orders; and, after describing the celebrated manœuvre of the six cohorts, who overthrew Pompey's cavalry, he says that perceiving the victory to be so far advanced, in order to complete it, he brought up the third line, which then had not been engaged. Pompey's infantry, being thus doubly attacked in front by fresh troops, and in re-re

<sup>a</sup> Fought in the year 46 before Christ.

by the victorious cohorts, could make no further resistance, but fled in disorder. Because we often find Cæsar's first line drawn up without intervals, some have fallen into the supposition (which I am inclined to think is erroneous) that the legionary formation had been altered in or before his time.

Be that as it may, the old Roman system, or the quincunx order, is that which has attracted the admiration of nearly all the military men in the world, and which, it is generally thought, would be practised in the present day were it not for the invention of gunpowder.

It must too be remembered that, excepting only the Greeks, all their enemies endeavoured to imitate the Roman tactics, and to adopt their weapons. And this did not merely occur amongst ignorant barbarians, who, being overcome by a certain system and certain arms, might naturally have thought them superior to everything else; for, Hannibal, whose wonderful campaigns have never been surpassed, after having defeated the Romans on the Tecinus, the Trebia, and lake Thrasymenus, with the spoils of those victories armed the flower of his Carthaginian infantry in the Roman manner. There could not possibly be higher praise bestowed on any military system than for the conqueror to adopt it, although belonging to the vanquished. Although the invention of gunpowder prevents modern infantry from adopting the tactics of the



legion, well organized cavalry in the present day, enters into action precisely on the same principles ; but this point we shall treat of in its proper place.

The account we have here given of the discipline, arms and tactics of the Greeks and Romans contains all the principal and most important points which are necessary to be known, in order that the history of their field warfare may be correctly understood. But it is the immense labour of their fortifications and the astonishing operations performed in their sieges, which strike our minds most forcibly with admiration and wonder. Many of the enormous machines, used by the ancients in the attack and defence of places, are beyond the reach of our present knowledge of mechanics, and the accounts given by the most respectable of their historians, are often to us incomprehensible, and are therefore deemed by many incredible or exaggerated. However, we shall now endeavour to present to the reader a succinct and simple account, (avoiding all that is improbable or uncertain) of the first rise of the art of fortification.

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In the very earliest ages, as soon as mankind began to be divided into tribes, they had recourse to rude kinds of fortifications for the protection of their towns or congregations of huts, against such



of the neighbouring septs as were too numerous and powerful to be engaged with on even terms in the open plain. Their first essays in this art were confined to the erection of a timber stockade, or a mud or stone wall, which surrounded the place; its form being circular, oblong, or polygonal, according to circumstances. Finding, in process of time, that besiegers could approach the base of these ramparts for the purpose of scaling or breaching them, without being much exposed, they invented projections of a square or semicircular form. From the breast works or parapets of these works, their archers could gall any assailant party which might attempt to plant scaling ladders or effect a breach in the curtain or main rampart. They afterwards further strengthened their fortifications by erecting high towers placed at intervals along the rampart, and in which were posted chosen archers. These towers commanded the whole space on the top of the wall included between each other. Their ramparts were sometimes of the enormous height of ninety or one hundred feet; but seldom of equal thickness with modern fortifications, the force of the projectiles they were destined to resist not being equally great. They were surmounted with parapets of masonry, six or seven feet high, and two feet thick, which were pierced with *erenêles* or loopholes for the archers to shoot through, without being exposed to the view of the besiegers. The addition to a

fortress of a ditch or fossè took place after the art of fortification had undergone considerable improvements.

It would appear that the defensive part of this art was, in the early ages, far superior to the offensive ; for sieges were then of much longer duration than in modern times. But before entering on this part of our subject, it may be satisfactory to the reader to give, as far as in our power, an account of the most remarkable of the celebrated warlike machines of antiquity. In the first place, the Aries, or battering ram, was, according to Josephus, a vast beam, like the mast of a ship, strengthened at one end with a head of iron, resembling that of a ram, whence it took its name ; and hung by the middle with ropes to another beam, which lay across two posts ; and hanging thus equally balanced, it was by a great number of men drawn backwards and pushed forwards, striking the wall with its iron head. But this engine did most execution when mounted on wheels, which is said to have been done at the siege of <sup>a</sup> Byzantium, by Philip of Macedon. In opposition to this, there was a lupus, or wolf, with which the besieged used to endeavour to grapple the ram, and break it or draw it towards themselves. For the protection of the men, who brought the battering ram forward into play against the enemy's

<sup>a</sup> In the year 340 before Christ.

ramparts, and for the filling up of the ditch and other purposes, a machine called a tortoise was used. It was made of strong and solid timber work, twelve feet high to the uppermost beam of the roof, and its four sides each above twenty-five feet. It was supported on four wheels, and the besiegers working underneath were safe, like a tortoise in its shell; for the roof was covered over with a thick coating of raw hides, hurdles, sea weed, or such other material as might be most at hand. A machine somewhat of this nature, and called a musculus was used by Cæsar at the siege of Marseilles. It was sixty feet in length, and moved upon rollers, the roof being covered with bricks and mortar, over which hides were placed, to save the mortar from being dissolved by the water which the besieged might pour down upon it. The celebrated moving towers were also of use in affording cover to the besiegers, when bringing forward the rams; and being made higher than the walls, and even with the towers of the city, archers placed on top could see in, to enfilade the terrace of the ramparts. They were made of beams and planks, as a house, and were covered on the outside with raw hides, as a protection against fire. They were supported and moved forward by a mechanical combination of wheels, with the principles of which we, of modern days, are entirely unacquainted. At the bottom of the towers were rams for battering the walls, and in the stories were

draw-bridges, made of two beams with rails of basket work, by means of which the besiegers passed over on the walls of the place. The basis of these towers were sometimes forty or fifty feet square, from which we may fancy what immense labour was required in the construction of them. The catapulta was a machine for discharging darts and arrows, and the balista was used for hurling large stones. Both these projectile instruments were made of various sizes, and some were even so small and light as to be employed in the open field.

We have no authentic account of regular parallels and approaches having been used by the ancients in the attack of fortified places, although some suppose that the platforms or mounds, (*aggeres*), so often spoken of in the history of sieges, were of the same nature as our modern approaches. Something of this nature must, of course, have been employed to protect the soldiers while at work, and hurdles, galleries of timber-work, and other contrivances were resorted to for the purpose. Cæsar, in speaking of the siege of Marseilles, relates that the place was so well "provided with all requisites of war, and so great was the multitude of machines to annoy the besiegers, that no mantlets were sufficient to withstand their violence; for they had wooden bars, twelve feet in length, armed at the point with iron, which were shot with such force from their balistæ, that they pierced four rows of hurdles and



entered a considerable way into the ground. To resist the violence of these batteries, the besiegers made use of galleries, whose roofs consisted of pieces of wood of about a foot in thickness, strongly compacted together. Under this cover, the materials necessary for raising the terrace were conveyed, and a tortoise, sixty feet long, composed of strong beams, and armed with every thing necessary to defend it against fire and stones, went before to level the ground.

Beside the labour of constructing the various machines and works which we have just described, a besieging army had also to make its lines of circumvallation and contravallation. The reader who may wish for a full and interesting description of these works, should study Cæsar's account of the celebrated siege of Alesia in Gaul. But, notwithstanding all the various means employed in the attack of ancient fortresses, still the defensive branch of the art (as before observed) always maintained its superiority over the offensive. Tyre, which was taken in the year 332 before Christ, detained the superb army of Alexander before it for seven months. The duration of most of their sieges was equally long or longer, and one of the most remarkable in antiquity, that of Syracuse, lasted three years before the <sup>d</sup> capture of the place.

<sup>d</sup> In the year 212 before Christ.



It was defended by the renowned geometrician, Archimedes, and the Roman general Marcellus attacked the place both by sea and land. But "on the side towards the sea were erected vast machines, putting forth, on a sudden over the walls, large beams with the necessary tackle, which striking with prodigious force on the enemy's galleys sunk them at once, while other ships hoisted up at the prows by iron grapples were drawn towards the shore, and after being whirled about and dashed against the rocks, which projected before the walls, were broken to pieces, and the crews perished." Marcellus, despairing of success on the sea side, determined to confine his operations entirely to the land, and immediately ordered a general assault. "When therefore the Romans were got close to the walls, undiscovered as they thought, they were welcomed with a shower of darts and huge pieces of rocks which fell as it were perpendicularly upon their heads; for the engines played from every part of the walls. This obliged them to retire, and when they were at some distance, shafts were shot at them in their retreat from the large machines, which made terrible havoc among them, as well as greatly damaged their shipping, without any possibility of their annoying the Syracusans in their turn. For Archimedes had placed most of his engines under covert of the walls; so that the Romans, infinitely distressed by an invisible enemy, seemed to fight

against the <sup>a</sup> gods." The place was afterwards carried by surprise.

Mining at sieges was much practised by the ancients, and several towns were taken by running a gallery under the walls, and then making an opening by which the besiegers suddenly entered. It was in this manner that Camillus took Veia, after the place had been ten years partially or wholly invested. Countermines were also employed for the purpose of destroying the works of the besiegers, and Cæsar speaks of the people of Aquitain as being particularly skilful in that art, because their country abounded in veins of copper.—Both kinds of mining were practised in a very similar manner. The method was, in the first place, to run a passage or gallery until, as they calculated, they were underneath the work which they wished to destroy, or the place where they desired to make an opening. They then dug out as large an excavation as circumstances required, supporting the roof of the cavity with strong beams, and afterwards filling it up with dry wood and other combustibles. When these were set fire to, the beams, supporting the roof of the mine, gave way, and the rampart, or whatever work was above it, of course fell in.

Field or temporary fortifications amongst the

<sup>a</sup> Plutarch's life of Marcellus.

ancients were of the very simplest construction, and yet were esteemed of great importance and advantage, insomuch that the Romans never neglected to fortify a camp, even though it were to be occupied for the shortest time. According to Polybius, on a march every Roman soldier carried two or three stakes, which on halting they used for fortifying the camp. This was always in a square form, and the method was to plant a double row of stakes interwoven with twigs in the manner of basket-work. In front of these they dug a ditch, generally about eight feet wide by six deep, and threw the earth of it between the two rows of stakes. This was done when they intended to make only a short halt; but in more permanent encampments they gave the parapet great relief and solidity, mingling with the earth turfs, cut in a certain size and form, and they also increased the dimensions of the ditch. Although the rule was to encamp in a square, we can hardly doubt but that there were occasional exceptions to it, when the nature of the ground suggested such. Both Cæsar and Pompey, when encamped near Dyrahacchium, occupied a number of the neighbouring hills with detachments, and built separate or detached field works on each of them.

We have not the least trace of any evidence that in the Greek or Roman armies there ever existed separate corps of engineers, for the direction of

troops employed in siege operations. On the contrary, we have every reason to believe, that all military officers were obliged to acquire such a practical knowledge of engineering as the circumstances of their warfare required, and that this was very considerable, may be inferred from the account already given of their fortifications and warlike engines. We find, that while the Romans gave golden collars and bracelets of honor for distinguished conduct in the open field, the mural crowns which were bestowed as rewards for skill and valour displayed at sieges, were fully as much prized as the first. To be able to acquire such mural crowns, a military officer must necessarily have acquainted himself with the mechanical combinations by which their wonderful engines were put in play, and with the other branches of the science of fortification. Indeed we have it on the authority of Plutarch, that military men were the first who applied geometry to the useful purposes of life. In his life of Marcellus, he informs us, that “the first that turned their thoughts to mechanics, a branch of knowledge which came afterwards to be so much admired, were Eudoxus and Archytus, who thus gave a variety, and an agreeable turn to geometry, and confirmed certain problems, by sensible experiments, and the use of instruments, which could not be demonstrated in the way of theorem. That problem, for example, of two mean proportional lines, which can-



not be found out geometrically, and yet are so necessary for the solution of other questions, they solved mechanically, by the assistance of certain instruments called mesolabes, taken from conic sections. But when Plato inveighed against them, with great indignation, as corrupting and debasing the excellence of geometry, by making her descend from incorporeal and intellectual to corporeal and sensible things, and obliging her to make use of matter, which requires much manual labour, and is the object of servile trades—then mechanics were separated from geometry, and being a long time despised by the philosopher, were considered as a branch of the military art.” Thus it is evident, that at a period when the most celebrated philosophers, such as Aristotle and Plato, appear to have esteemed their own disputations, and captious wranglings on metaphysical questions as more honorable than practical science—it is to soldiers that we owe the first rise of experimental philosophy. And throughout all history, a careful observer will ever remark the military, like the advance guard, in the march of the other arts and sciences. This noble art, practised and studied for the protection of regular and settled communities, against the assaults of roving tribes of hunters and plunderers, has been one of the principal means of improving, enlightening, and embellishing the society it was originally destined to protect.



Without doubt, the invention of gunpowder has so completely changed the nature of all military projectiles, that the Art of War itself, would appear to have assumed an entirely new character ; and it is, therefore, that many professional writers would endeavour to persuade us that we can reap no advantage from the study of ancient warfare. But if we were to learn nothing else from their military history than a knowledge of the variety, finesse, and artfulness of their stratagems, it would amply repay us for the time bestowed on the study. However, this is but a small portion of the instruction which we owe to the Greeks and Romans. Is it possible to avoid believing, that the great Frederick of Prussia owed the oblique order of attack to his having studied the battles of the Theban general, Epaminondas ? “And how true and sublime was the remark of the latter, who, when his friends were lamenting the misfortune of his dying without issue, replied, that he “left behind him two immortal daughters, the battles of Leuctra and Mantinea, which were quite enough to perpetuate his name.” In its proper place will be given a description of the famous order of battle put in practice by Frederick, preparatory to the battle of Leuthen, and elsewhere. It strikes me, as not at all improbable, that the idea of it was suggested to his mind by the account of Hamilcar’s march against the revolted Carthaginian mercenaries under Spendius, which

is ably given by the Chevalier de Folard, in his commentaries on Polybius. Hamilcar's intention was to array his army for action in three lines—the first the elephants—the second the cavalry—and the third the heavy armed infantry. Each of these lines marched in four columns, the cavalry closing up in rear of the elephants, and the infantry again in the rear of them ; so that there were altogether but four columns. The distance between the columns being equal to their fronts—their wheeling into order of battle was an operation that took up but a short space of time.

It is said by many, and apparently with some degree of truth, that the military knowledge of the ancients of all countries, whatever, must have been inferior to that of the moderns, because amongst them battles were in general decided more by the personal qualities of the soldiers, their courage, prowess and dexterity in the use of their weapons, than by the tactical skill and science of the general. However, this argument is very much shaken by the example of Hannibal, who with troops <sup>a</sup> confessedly inferior to the Romans, vanquished them repeatedly, being indebted for his victories to nothing but the inspirations of his own mighty genius.

The student who reads carefully, and in the true spirit of his profession, the history of Grecian and

<sup>a</sup> If they were not so, Hannibal would not have adopted the Roman formation, and Roman arms for his own chosen infantry.

Roman warfare, will find it impossible to agree with those military writers, who account the science of strategy to be entirely of modern date. Many circumstances in that history tend to prove the contrary, of which our limits will only allow us to mention a few instances. When Lucullus was invading Parthia, (in the year 67 before Christ,) his soldiers were anxious for him to halt and take an insignificant fort in which they hoped to find some treasure. He pointed to Mount Taurus, and replied, "yonder is the fort you are to take; as for these things, they will, of course, belong to the conquerors." This speech displayed both a bold daring and a consummate knowledge of his science. Under Mount Taurus was the city of Tigranocerta, containing the treasury and principal magazines of Tigranes, and there the king was concentrating and organizing his forces. It was, therefore, the business of the Romans to push on rapidly and strike a blow at the heart of the enemy's power before he could complete his arrangements. A timid general would not have left any fort in rear of his flanks, through fear for his communications and his retreat. Lucullus knew that a small garrison could not cut off his retreat; and that by advancing he risked only a partial loss in case of retreat, while he placed the very existence of his enemy in jeopardy.

Twelve years afterwards, in an attempted in-

vasion of the same country, Marcus Crassus lost his life, his army, and his reputation. There were two territorial lines of operation for him to move upon, namely, that of the Armenia and that of Mesopotamia, the former a hilly but fertile country, and the latter a sandy plain of great extent. His ally, Artavasdes, king of Armenia, advised him to operate upon the former territorial line. "By that means," said he, "you will not only have plenty of provisions, which I shall take care to supply you with; but your march will be safe, as it will be along a chain of mountains and a country almost impracticable for cavalry, in which the Parthian strength consists." Crassus blindly wishing to take the shortest route to Seleucia, the Parthian capital, made an erroneous choice of his territorial line of operation, and after having exposed his army to much hardship in the arid plains of Mesopotamia, was attacked and destroyed by the superior cavalry of the enemy.

The principles of strategical combinations are fully developed in Alexander's, Hannibal's, and Cæsar's campaigns, which prove that the sublime science of the general-in-chief has only been renewed and not invented in modern times. It would exceed the intention of this work to give a relation of those most interesting campaigns; but the student should read attentively the sketch of them composed by Napoleon, and dictated to Count



Montholon at St. Helena. He therein proves that the warfare of those great captains of antiquity was methodical and based on the same unvarying principles which guided his own operations. And surely, if the mind of that man, whose deeds have dimmed the lustre of all his predecessors, could reap instruction from the study of the wars of ancient days, it would ill become us to despise or neglect in the least degree the history of the actions performed by the warriors of old.



## SECOND ÆRA.

IN the mode of practising the military art amongst the Romans, no very important alteration took place until the commencement of that course of political demoralization, which brought on the gradual decline of their empire. As long as their dominion was confined within the narrow boundaries of Italy, their army was nothing more than a militia, amongst whom, on account of the agricultural pursuits and, consequently, simple manners of the people, discipline was easily maintained; and when on actual service, the strictest obedience was exacted and cheerfully yielded, from a sense of community of interests and feeling between the citizen soldiers and their superiors. Even after their conquests had become very much extended, their excellent military organization endured for a long period despite their defective political constitution. Their military colonies, established on the wisest principles, supplied with recruits the legions quartered on the frontiers, and in the distant provinces. They had eight legions on the Rhine, two on the Danube, four on the frontiers of Syria,

three in Spain ; in Africa, in Egypt, in Mysia, and in Dalmatia, each two. The whole of their active army, in the time of Augustus, must have exceeded three hundred thousand men in the highest state of efficiency, besides the Pretorian guards, quartered in Rome for the protection of the emperor's person, and consisting of ten cohorts, each one thousand strong. But this could not last ; health and vigour could not continue to pervade the limbs, while the vital parts of the body were in a state of decay. The legions quartered in remote provinces could not continue long to preserve an excellent moral, and tactical organization, while the Pretorian guards, the grand reserve of the army, were sunk in corruption and debauchery. These troops, resident in the capital, became, of course, involved in the general licentiousness of manners, which pervaded all ranks of the degenerate Roman citizens. They grew mutinous, disorderly, and venal, were always ready to declare him emperor who promised them high pay and lax discipline ; and the example of their mal-practices and crimes gradually spread throughout the whole of the army. The foundations of military honor and discipline being thus sapped, they began to adopt the weapons and tactical arrangement of their barbarian neighbours on the frontiers, as being less irksome and laborious than the ancient Roman discipline. These circumstances, more than any other, hastened the down-

fall of the Roman power ; for hereby the tactics of their armies being reduced to an equality with those of their barbarous enemies, they became unable to withstand the numerous hordes which poured in upon the Roman provinces, and erected new kingdoms on the ruins of the empire.

The nations, which had for a long time been threatening with destruction the Roman empire, and at last overran all its most important divisions, as Gaul, Spain, and even Italy itself, towards the end of the fifth century, were sunk in a state of the grossest ignorance and barbarism. Their warlike weapons were of the rudest kind, and their military discipline of the simplest and most primitive nature. An increasing population in the countries of Germany, Sarmathia, and Scythia, who were totally destitute of skill to take advantage of the natural resources of the soil, sent forth numerous colonies under chosen leaders to seek subsistence and settlement in the more fertile and inviting regions of the south. The leaders of these savage hordes were commonly elected in consideration of their bodily strength and activity, combined with courageous and resolute minds ; such qualities being the most useful and essential to the chieftains of uncivilized tribes, circumstanced as the northern Europeans were in those dark ages. Their followers yielded them obedience from the conviction of the necessity of having some directors

and guides in their search after settlements. On gaining permanent possession of any country, the leader of each tribe apportioned the lands amongst his followers, on condition of military service ; the small remnant of conquered inhabitants being reduced to a state of villenage or soil slavery ; and the office of chieftainship, which was at first elective, becoming in process of time hereditary.

All the arts and sciences known to the Greeks and Romans (and, of course, the military art as practised by them) naturally fell into oblivion under the influence and operation of the barbarous and blighting political and military constitution, which then overspread nearly all Europe, under the denomination of the Feodal System. Ireland, where this system did not exist, was the only country in Europe, where a regular standing army was kept on foot during the dark ages ; and the consequence was, that, for many centuries, the Irish successfully resisted the attacks of their numerous invaders, until the discipline of their army became corrupted, and its numbers diminished, during the century of peace they enjoyed previously to the Anglo-Norman invasion, 1172.

In reviewing the military system of the feodal times we must in the first instance direct our attention to the cavalry, which was the primary arm amongst the people of those days, as it has most commonly been and is now amongst the uncivilized



nations of the earth. The reasons why this has been almost universally the case shall be discussed in the proper place ; and in the mean time, I shall endeavour to give a plain account of the peculiar nature of the feudal eavalry.

It was constituted on totally different principles from those of the infantry, consisting almost entirely of the nobility and their near relations, together with a few chosen, faithful and familiar retainers. As the fashion of those days prohibited a gentleman from exereising any other profession than that of arms, the nobles and gentry (particularly in the early period of the middle ages) devoted themselves entirely to warlike exereises, and usually held in contempt an acquaintance with the first rudiments of a literary education. Hunting, hawking, throwing the bar, swordmanship and military equitation, were the favorite oceupations of the rude and bold aristocraey, which formed the eavalry of those dark ages, and whose hardy pursuits rendered them individually most formidable soldiers. The clergy, from their learning and acquaintance with the Greek and Roman classics, were enabled to instruct the laity in the use of ancient armour ; which however was variously modified in different countries. But the eavaliers of Christendom must have been always far superior to the equites of pagan Rome, were it only from the circumstance of their acquaintance with the use of stirrups, which were entirely unknown to the



latter, and without which it is quite impossible to render an equestrian soldier by any means formidable. The feudal cavalry being composed of the higher orders of society, were well provided with arms, because they could afford to buy them ; and having no other occupation, they were constantly employed in military exercises ; and their service being regarded as most noble and respectable, their esprit de corps was of the very highest description. Indeed the whole strength of a feudal army was supposed to lie in the men-at-arms or heavy-armed cavaliers, who were emphatically styled “ The Battle ;” while upon the neglected infantry the common epithets bestowed were, <sup>a</sup> badly armed, ill complexioned, sluggards, pillagers, and eaters of the people. The term cavalry (or cavalerie, derived from the Latin caballus, a horse) was first adopted in those times when the word cavalier, or horseman, was synonymous with gentleman.

The offensive weapons of a knight or man-at-arms were usually an extremely large wide-bladed sword, sometimes accompanied by an epee à l’*estoc*, or stabbing sword, of French origin, which was attached to the pommel of the saddle, a falchion or else a dagger with a very broad blade tapering to a point. Some knights used heavy maces or bâtons ferès ; and

<sup>a</sup> Mal armes, mal complexiones, faineans, pillards, et mangeurs de peuples.

others again carried short <sup>a</sup> battle axes. But the principal weapon, which a good and true knight relied most upon, was the long and stout lance so much celebrated in the songs of the days of chivalry. A couple of the knight's mounted attendants were commonly armed with cross-bows, or else common bows and arrows.

The defensive armour of the feudal cavalry varied a little in the different countries of Europe ; but I shall endeavour to describe that most commonly used in England and France. A cavalier, for the protection of his head, wore a helmet of iron with a vizor or grate. Leaders and standard bearers wore beavers with thin plates of iron fastened on before the face. The body of a man-at-arms was protected by a coat of fence called mail, composed of a wambais, i. e. a tunic wadded with wool or tow and stitched lengthways, over which was placed an iron shirt, formed of iron links interlaced so as to prevent an arrow from penetrating. These iron rings or links had joints at convenient distances, and so contrived as to move upon each other with the greatest facility. This species of armour, which came into fashion about the middle of the eleventh century, maintained its ground, according to some authors, till the fifteenth ; but Mr. Grose affirms that both in France and England the

<sup>a</sup> The favorite weapon of Richard Cœur de Lion.

plate armour was completely introduced about the year 1370. Even after the introduction of plate armour, however, many gentlemen chose to arm themselves *mi-partie*, that is, partly in one kind of armour, partly in the other. Plate armour consisted of different pieces of thin but strong metal to cover the back, breast, shoulders, arms, hands, thighs, legs and feet; each piece called by a particular name; and they were usually fastened together by steel rivets with heavy brass knobs. Milan was the town of all Europe most remarkable for the manufacture of good armour.

But the knights of old were not contented merely with clothing their own persons in steel or iron. The same care was extended to their noble steeds. Horse-armour was composed of chanfrain or kind of mask for the face and ears, with sometimes a spike projecting from the centre of the forehead; a criniere to guard the mane, a poitrinal, or breast-plate; and a croupiere, or buttock-piece, that usually hung down to the hocks. The Normans were the first who adopted horse-armour. It is obvious that barbed steeds, clothed with such heavy burdens, could not sustain the fatigues both of carrying their iron-clad masters on the march and in the battle. It was therefore the custom for the *mèn-at-arms* to travel on hackneys, while their war-horses were led by grooms.

The ancient cavaliers were accustomed to be

addressed by the title of master, in contradistinction to the attendants who always accompanied them to the field, and who were styled servants. French chevaliers were followed by at least three horse archers, one ecuyer or varlet, that is, a young gentleman, who from birth and blood, had a right to aspire to the rank of knighthood; and by a coutelier, who was armed with a long sharp knife, and whose duty it was to despatch a fallen adversary, if he should refuse to beg his life. Amongst the chivalry of Poland, every master was accompanied by nine servants. From these circumstances, when in the histories of the middle ages, we read of a hundred knights or men-at-arms performing any action, we may infer that from five hundred to a thousand cavalry were engaged. The masters were the only persons armed with lances, and we often find a force of cavalry counted by the number of lances.

It is in the time of Phillippe Auguste of France, who ascended the throne in the year 1120, that, for the first time, we find much mention made of chevaliers or knights; although, without doubt, some sort of knighthood<sup>a</sup> existed before this period in various parts of Europe; but the rules of the

<sup>a</sup> It is well known that orders of military knighthood existed in pagan Ireland long previously to the Christian æra; but an account of them would have no connection with the immediate object of this work.



order were not established or regulated, nor the division into two classes instituted. The honor of knighthood was attainable only by men of good birth and valiant conduct; and various were the ceremonies used in their admission, such as the buckling of the gold spurs, the girding on of the belt, sword, and so forth. The first class was composed of the knights bannerets; these were gentlemen having certain landed possessions, and being able to bring into the field fifty mounted men-at-arms, which entitled them to carry banners. The second class were knights bachelors, who if they had any vassals in their suite were permitted to display pennons, and ranged themselves under the banner of some banneret. The banners were of a square form and the pennons pointed.

Although the knights and men-at-arms, or "The Battle," were all heavy-armed horsemen; yet in the early pages of our histories, we occasionally read of light cavalry men acting as scouts and skirmishers. These were the archers attendant on the knights, who, it must be remarked, were never formed into regular bands or companies till the reign of Charles the seventh of France in 1445. In the thirteenth, fourteenth and fifteenth centuries we find a species of Albanian light horse, called estradiots, employed by the Venetian and Genoese Republics, by the French and others. In those days there was also a Spanish force of light horse com-



posed principally of Basques, and called Carabins. They derived their name from the Arabic word Karab, which signifies any warlike weapon. As numbers of them came afterwards into the French service, on the union of the thrones of Navarre and France, it is not improbable but that they gave their own name to that fire-arm, which has since become so common in the cavalry service. But to return; throughout the middle ages all sorts of light horse were regarded by the men-at-arms with great contempt, and they were in truth mere scouts and marauders.

Nothing we read of in the history of the warfare of the middle ages indicates any thing like a regularly established tactical formation for the cavalry. They appear to have paid little attention to any other order than simply that of each knight posting himself near the banner of his banneret, and that of all the followers keeping close to the pennons of their respective knights bachelors. They had these fixed rallying points to move by, and all the rest was trusted to fortune, courage, and manhood. No record of those times convey a more thorough and distinct idea of the nature of their warfare than do the "chronicles of Froissart," which treat of the wars from the latter part of the reign of Edward the Second to those of the Black Prince. In this most interesting work we observe the heavy men-at-arms combatting equally on horse and foot; and

although instances of skill on the part of the commanders occasionally occur, little or nothing of tactical science is ever displayed. I can call to my mind only one instance of cavalry being made to charge the enemy in full gallop. This occurred in Spain, in the wars between Don Pedro and his bastard brother Henry, who were contending for the throne of Castille. Sir Bertrand du Guesclin, who commanded King Henry's French allies, took six thousand French and Spanish men-at-arms, and advanced against Don Pedro's army, forty thousand strong, and then in march near to Montiel. He charged, in close order, and at full gallop, upon the van or head of the column, rolling it up, and completely and entirely defeated it. This action took place in the year 1368. This remarkable example of the only true and efficacious method of attack with cavalry was not only neglected at that period, but scarcely an instance occurred in Europe of a charge in full gallop for nearly four centuries afterwards. It may be observed, however, that both men and horses amongst the chivalry of those days were too heavily armed to be capable of much rapidity of movement. In the tournaments, indeed, their chargers might be able to perform a few courses or careers (as they were called) ; but the successive and repeated charges of a well sustained cavalry action must have been too much for them, carrying such immense weight as they did. But nothing can give

us a more striking idea of their ignorance of the true nature of cavalry than Froissart's account of an action fought at Cocherel in Normandy, between the English and Navarrois, under the Captal de Buch, and the French under Sir Bertrand du Guesclin. The Captal, with his men-at-arms, occupied a height, from which du Guesclin enticed him by a feigned retreat. Both parties dismounted to fight, and having ranged their banners parallel to each other, the knights and squires (says Froissart) then spread themselves over the plain, and began to fight with all sorts of weapons, just as they could lay hands upon them, and each party met the other with great courage, the English and Navarrois shouted "St. George," the French "Notre Dame Guesclin." This appears a sufficiently rude mode of combatting; yet it was the same du Guesclin, who commanded the French on this occasion, that four years afterwards displayed such considerable skill and judgment in his attack on Don Pedro's army near Montiel.

Although, in the ages antecedent to the revival of literature, the cavalry service appears to have been little or not at all understood in Europe; yet, we observe in another quarter of the globe a mighty conqueror, whose great genius had thoroughly embraced the true principles of that arm. Timour, who commenced his career of conquest in the year 1370, was obliged, from the nature of the countries

he overran, and from the habits of the Asiatic people he commanded, to employ cavalry principally ; and he has often taken the field with ninety thousand horse. He formed his cavalry in three lines ; and his usual order of attack was in double grand echellons from the centre. A strong reserve posted in front of the centre of the second and third lines was in readiness to afford support to such of the echellons as might require it. The second line promptly supported the attack of the first ; and the third was prepared to complete the victory and continue the pursuit. The basis of Timour's system of tactics, like that of well organized cavalry in the present day, was successive charges and strong and well directed reserves. The minor tactical details, of course, differ, but the grand principle is the same. The European chivalry have left us no lessons, either in tactics or strategy, equal to what this great Asiatic soldier has taught us.

It is now time to turn our attention to the constitution of the feudal infantry. The class of persons, of whom this force was composed, were those who held land on the condition of serving in the field for forty days in each year, which was generally the duration of a campaign in the earlier or dark period of the middle ages. The only opportunities of military instruction commonly afforded to this militia were periodical musters, called by the nations of Germanic origin *wappen-schaws* or



weapon-shewings, at which the vassals of each chieftain, lord, or baron, were obliged to appear and be exercised in archery, slinging, or the use of some weapon. The arms of this force varied, of course, in the different countries of Europe; but in the British Islands, the most famous weapons were the broad-headed, leaf-shaped lance of Phenician origin, called by the Irish lagean, two-handed swords, and the bow-and-arrow. The bow, for skill in the use of which the English were once so renowned, was not originally an Anglo-Saxon weapon; but was derived through the Welsh from the Irish, amongst whom the practice of archery was so common, that according to some writers the name of their country is derived from Irr, the Runie for a bow. Be that as it may, the skill of the English in arrow shooting exceeded that of all other nations in the feudal times; and it is chiefly to this cause that their success at Cressy, Poitiers, and elsewhere, should be attributed. Many laws were passed in England at different periods, for the encouragement of the practice of archery, so that the bow became the principal weapon of her foot militia, and was not laid aside after the invention of gunpowder, until it had been for a long time abandoned by every other nation in Europe. The bill of the English yeoman, of which much mention is made, was only a modification of the Irish lagean.

It would be the part of an antiquarian to enter



into a minute description of all the varieties of weapons used by the infantry in the dark ages of Europe ; but it may be very easily imagined, that a force which was rarely mustered in regular bodies, and never exercised in tactical evolutions, must have been any thing but a respectable branch of an army. Indeed, they were usually provided with no other defensive armour than shields of wood or ox hide, and leathern buffjackets ; which alone precluded the possibility of their offering an obstinate resistance to men-at-arms cased in complete armour. This, together with the circumstance of their being recruited from the lowest classes of society, caused the cavaliers to regard them with the greatest contempt ; and so little reliance was placed on their exertions, that we generally find the strength of armies rated by the number of knights and squires without any account being taken of the yeomanry or foot soldiers. This was more the case in the continental than the English armies ; for the famous archery of the common woods-men of England gave them some consideration ; and, indeed, it may be remarked, generally, that the lower orders in England and Scotland were never treated with the same extreme contempt as those of the Continent.

Some writers denominate the whole of the period included between the fall of the Roman empire and the revival of literature, as the dark ages. But that appears to me somewhat incorrect, for in

the eleventh century, a bright light of honor and chivalry began to dawn on the world, tending towards the gradual civilization of mankind. The crusades commenced in the year 1096, and, however wild and fanatical the purposes for which they were undertaken, may be supposed to be, they have conferred the greatest blessings on Europe. They have been the means of improving commerce and navigation as well as the military art. It has been before observed, that the feudal militia, from its want of opportunity of military instruction, must have been very deficient in most of the characteristics which belong to a good army. Now the princes and nobles, who led troops into Palestine, were obliged to take their followers into permanent service, the distance of that country and the nature of the war not promising the speedy conclusion commonly expected in the petty quarrels of the princes of Christendom. During the two centuries, in which these wars were carried on, the foot soldiers naturally acquired a military spirit and discipline unknown to their predecessors; and many of the armies being commanded by priestly generals, well versed in Greek and Roman literature, experiments were made in the tactics and evolutions described by their writers. This circumstance had a tendency to bring the merits of the infantry under discussion, its reputation being supported by the learning of the priesthood, who could

quote in its favor the examples of the most war-like nations of antiquity, the Jews, Greeks, and Romans, who always placed their chiefest confidence on this branch of their armies.

Another circumstance conducive to the respectability of the foot arose from the absence in the Holy Land of many turbulent barons with their high-born retainers, who had been in the habit of using their inordinate power to oppress the lower orders of society, and to insult the authority of their sovereigns and the laws. The kings of Europe, taking advantage of this favourable opportunity, began to make laws for controlling the power of the nobility, and to support themselves in these measures, had recourse to the aid of the common people, chosen bands of whom they armed and permanently retained. Bands of foreigners, called Free Companies, (as well foot as horse,) and commanded by young adventurers of good family, many of whom had served in the crusades, were also hired by the different monarchs for the support of their authority. The troops of this nature employed in Britain, were commonly Flemish halberdiers, whose discipline and steadiness tended in no small degree to advance the reputation of the foot.

But in those days, when the foot was held in such utter contempt, and when in truth it was of the very poorest description, still there are not wanting many

examples in proof that it is the most effective and formidable branch of any army. The great victories of the Scots at <sup>a</sup> Bannockburn, and of the English at <sup>b</sup> Cressy and <sup>c</sup> Poitiers, were entirely owing to the foot. The battle of Bannockburn was won by the compact order and impenetrability of the Scottish pike-armed foot, upon whose solid and steady mass the English knights and squires could make no impression. The victory at Cressy was gained by the excellent practice of the English archers. In the French army there was a large body of Genoese bow-men, who began the battle, supported in rear by the chivalry of France on horseback. The quick and vigorous shooting of the English soon caused the Genoese to turn about and retreat, breaking in amongst the ranks of the men-at-arms. The arrows of the English continued to fall thick and fast, and wounding numbers of the French horses, caused them to caper and fall amongst the Genoese fugitives, so as to create the greatest confusion. It is a singular fact that some Welsh and Cornish men, who had armed themselves only with large knives, rushed suddenly out on the French, while in this state of disorder, and made a great slaughter of them. The success of the English at Poitiers was also due to their cross-bow-men, who had been skilfully posted

<sup>a</sup> Fought in the year 1314.

<sup>b</sup> Gained in the year 1346.

<sup>c</sup> Anno Domini, 1356.



in rear of hedges, from which they were enabled to direct a cross fire (if I may be allowed to apply the term to arrow shooting) upon the advancing enemy. Yet all those memorable instances of the efficiency of the foot were insufficient to raise them to any degree of estimation in the opinion of the half civilized cavaliers of those romantic ages, when personal valour and prowess were more highly valued than talents or military skill of the first order, if not accompanied by those knightly qualities, they so much admired.

But more was done to elevate the character of the infantry service by the Swiss mountaineers than by any other people in Europe. In the year 1307 the liberty of Switzerland was achieved by the exertions of the renowned William Tell ; and that country became involved for many years in obstinate struggles with the house of Austria. The Swiss, from the poverty of their country, were very deficient in cavalry ; and were consequently obliged to place their chief confidence in their foot ; and in order to render it capable of withstanding the heavy armed Austrian horse, they adopted for defensive armour strong metal breast-plates and helmets, and for offensive weapons long halberds and heavy swords. The astonishing success of the Swiss infantry gained for it so much renown in Europe, that many kings took large bodies of them into their service ; but their own high notions of their prowess often ren-



dering them mutinous and turbulent, their employers were induced to organize and discipline bodies of national infantry to avoid a dependance on foreign mercenaries. The first European monarch, who organized a regular permanent force of infantry, was Charles the Seventh of France, surnamed the Victorious. He ascended the throne in the year 1422, and having remodelled his cavalry, forming the ancient men-at-arms into *compagnies d'ordonnance*, or regulated troops, he also turned his attention to the reformation of the foot. He ordained that each parish of the kingdom should furnish one of its best men to serve with bow and arrow, wherever His Majesty should require, and he exempted these new soldiers from all taxes during their life. This freedom was the cause of their being named *Franc Archers*. They were sixteen thousand strong, and organized in four divisions, each division being under the orders of a Captain General, and again subdivided in companies, each five hundred strong. The result of this organization of a standing army on a well regulated footing was, that by means of its discipline and good order, he was enabled at length to drive the English out of his kingdom, and to reconquer Normandy, which had been thirty-two years in their possession.

The manner in which the term infantry came to be applied to the foot soldiers of an army is accounted for in different ways. Some suppose that while the

gentlemen, who composed the cavalry, were addressed by the respectful titles cavaliers, messieurs, &c. the foot, on the other hand, which consisted of common people, were spoken to familiarly, as “mes enfans,” my lads. Hence the word *enfanterie* or *infanterie*. But some derive the name from a more honorable origin, relating that one of the kings of Spain being engaged with the Moors, the whole of his men-at-arms were defeated and in full retreat, when the Infanta, collecting a body of foot, hastened to her father’s assistance, and totally routed the infidel enemy. In order to commemorate so extraordinary an action, the Spanish foot was henceforth called infantry, from the title of the illustrious princess, who led them in so glorious a <sup>a</sup> manner.

During the middle ages, the art of fortification does not appear to have undergone any improvement, but rather to have retrograded ; for the sieges of which we read, being undertaken by armies, whose principal strength lay in their cavalry, ought more properly be called blockades ; nor do we perceive in them many traces of that skill and science which were displayed in the attack and defence of most of the ancient fortresses, as Tyre, Syracuse, Alesia,

<sup>a</sup> I regret that I have not been able to establish the justice of the above derivation on the authority of any authentic record. I have merely met with the anecdote in different military works, particularly in an excellent French military dictionary, published by royal authority in 1758.

Marseilles, &c. The bold and fierce spirit of chivalry was not of that patient and enduring nature, which carries men through the slow and painful operations of a siege, and it is therefore that we seldom find the impetuous cavaliers of those romantic ages shutting themselves up in their castles and fortresses, until their last hope in the field had failed them ; and then it is observable that these strongholds were most commonly reduced by some lucky accident or stratagem. Occasionally we find the ancient system of mining, before described, resorted to, and rude imitations of the Greek and Roman projectiles brought into play ; but the ordinary mode of proceeding in the attack of a place was first to attempt a surprise or a general assault and escalade, and then, if unsuccessful, to establish a close blockade.

The castles built in the early centuries are of very curious construction, being intended for the confinement of prisoners in their deep and subterraneous dungeons, as well as for protection from external enemies. The point to which the builders of them paid the greatest attention was the strengthening of the gateways by means of draw-bridges, portcullises and machicoles, which they likewise placed over every unflanked portion of the walls. The portcullis was a sliding gate, so constructed as to be moveable in a frame placed over the gateway, and from which it could be let down instantaneously ; it

was a most useful contrivance in those days, when sortie parties having no covertways into which to retreat under protection of the cannon or musquetry of the rampart, they were often so closely pursued that the besiegers entered pell-mell with them into the place. The machicole was a kind of balcony built upon large stones, called corbels, projecting about three feet beyond the edge of the wall ; upon these was placed a stone floor, either arched or formed with long flat stones ; and through it were pierced vertical loop-holes, which enabled the besieged to discover any assailants, who might approach the base of the wall or the gateway. The same contrivance is at present used over the door-ways of martello towers. Although the above mentioned works and some few others of little importance were invented during the middle ages ; yet that period was very far indeed from being productive of any improvements in the art of fortification. Some of their sieges may be read with interest on account of the romantic valour and devotion of the combatants ; but not for the sake of professional information.

In truth, we might almost affirm that, in the long period included between the fall of the Roman Empire, and the latter end of the fifteenth century, true military science was lost and unknown in Europe. The whole attention of the warriors of those days appears to have been devoted to the education and perfectioning of the individual com-



batant, to whose valour, prowess, and expertness in the use of his arms, every thing was confided, rather than to the just and scientific application of the principles of tactics and strategy, with which these gallant gentlemen were little or not at all acquainted. Of their utter ignorance of scientific warfare, there cannot be a more remarkable example than king Edward's first expedition against the Scots in 1337. The Scots had entered England burning and pillaging all Northumberland, exactly in the same <sup>a</sup> style and manner as the Pindarries, a few years ago, overran the provinces of central India. The king of England with his army was at Durham, waiting in hopes of an opportunity of giving battle to the enemy; and when they approached near to him, (of which he had no other information than what he obtained from the smoke of the fires in the Scottish camp,) he put his troops in motion against them. After two days' hard marching, he had not overtaken the Scots. It was then resolved in full council, that they should march at midnight in hope of falling on the Scots before they could cross the Tyne. In this, however, they were disappointed, although, according to Froissart, "each man galloped forward as fast as possible over the rocks and mountains, sword in hand, with helmets and shields prepared for fighting,

<sup>a</sup> See Froissart's "Chronicles," chapter 18.



without waiting either for commander or companion, father, brother, or friend ;” and it was said by those in the army, who best knew the country, that they “ had travelled that day twenty English leagues on a gallop without stopping, except to arrange the furniture of their horses, when it had been loosed by the violent exercise.” They crossed the Tyne that evening, but none of the English lords or barons knew where they were, until informed by some peasants, that they were fourteen leagues from Newcastle and eleven from Carlisle, and that there was no place nearer from which they could get supplies. Froissart, after giving an account of the deplorable condition in which the English were while on the banks of the Tyne, for want of provisions and forage, goes on to say, that “ having continued for a whole week without hearing any tidings of the Scots, who they imagined must pass that way, or very near it, in their return home, great murmurs arose in the army, and many laid the fault on those who had given such advice, adding that it was done in order to betray the king and his host. Upon which, the lords of council ordered the army to make ready to march, and cross the river, seven leagues higher up, where the ford was better ; and it was proclaimed that every one was to be in readiness to march the next day and to follow his banners. There was another proclamation made, that whosoever chose to take pains and find out where the

Seots were, and should bring intelligence of it to the king, the messenger of such news should have one hundred pounds a year in land, and be made a knight by the king himself. When this was made known amongst the host, many knights and squires, to the number of fifteen or sixteen, eager to gain such rewards, passed the river, with much danger ascended the mountains, and then separated, each taking different routes."

The army marched next day as ordered, but continued labouring in the mountains for nearly three days, without any defined plan, except the hope that some chance might throw them in the way of the enemy. On the third day, at three o'clock, an esquire, who had been out in search of the hostile force, came galloping in great haste to the king, and exclaimed, "Sire, I bring you news of the Scots; they are three leagues from this place, lodged on a mountain, where they have been this week waiting for you. They knew no more where you were than you did them; and you may depend on this as true; for I approached so near to them, that I was taken and led a prisoner to their army before their chiefs. I informed them where you were, and that you were seeking them to give them battle. The lords gave me up my ransom and my liberty when I informed them, that you had promised one hundred pounds a year as a reward for whoever should first bring intelligence of them, upon con-

dition, that he rested not until he gave you this information ; and I now tell you, that you will find them in the place I have mentioned, as eager to meet you in battle as yourself can be." However, when king Edward did approach the Scots, he found them posted on the slope of a mountain, with a river in front, from which position they were too cautious to descend. In this position they remained three days, endeavouring to provoke the English to attack them. They then decamped to another similar position, where the same farce was acted over again ; and in the night they stole away into Scotland. The English king then returned to York, where he disbanded his feudal militia, who were only engaged to forty days' service, and thus the campaign was concluded.

Although, upon the whole, the history of the warfare of the middle ages cannot be said to be particularly instructive in a scientific point of view ; yet, even here are observable many circumstances worthy of admiration and imitation ; for the genius of some great men will shine brightly through the mists of the darkest and deepest ignorance of their contemporaries. The combined daring and skill of Henry the Fifth in France, have rarely been surpassed ; and the battle fought at Agincourt, in the year 1415, is one of the many proofs of how a small army may defeat a superior one by manœuvring so as to bring the greater force to bear

on the point in dispute. The English were posted on the summit of a gentle acclivity, the flanks of which were covered with hedges and impenetrable brushwood. Within this space, the French men-at-arms rashly advanced, their numbers creating crowding and confusion, which was further increased by a shower of arrows from two hundred archers, whom Henry had placed in ambush in a meadow on one flank of the French. The enemy's men-at-arms, some being mounted and others on foot, were severely galled in their advance by the arrows of the English foot, who effectually protected themselves from a charge of cavalry by placing stakes along their front. The French failing in their first assault, were hotly pursued by the English, who were armed with their famous bills ; and the narrowness of the ground obstructing their retreat, the English followed upon a larger front and entirely overthrew them. The infantry, which thus defeated the French cavaliers, was unprovided with other defensive arms than their shields and helmets ; for we are told that Henry, by way of encouraging his troops, promised that every soldier who performed his duty, should be entitled to the rank of gentleman and the privilege of wearing coat armour.

Although there were not one single instance of skill or science discoverable in the whole history of the wars of the days of chivalry, still is that period



worthy the deepest attention of the soldier and the gentleman. To the sublime principles of honor, which ruled and guided the gallant knights of old, the world owes its present civilization and improvement in all the arts, which embellish life and contribute so much to the happiness of mankind. Previously to the institution of chivalry, the manners and habits of our ancestors were barbarous and rude in the extreme. Women were treated with the greatest rigour, and regarded with the most sovereign contempt; and as long as that continued to be the custom, the nations were of course unable to advance beyond a state of semi-barbarism. But the noble spirit of chivalry, which is in truth but the reflected light of pure religion, soon corrected this mistake, and if it sometimes led our valiant and warm-hearted forefathers into little extravagancies, still it was the guiding spring in all their enterprizes, and caused their conduct to be just, loyal and honorable. To this spirit of chivalry we owe the first grand step in the march of improvement. It refined, purified, and elevated the nature of men's attachment to the gentler sex, and gave to them all that delightful and humanizing influence <sup>a</sup> "which is necessary not only for raising man from savage life, but for saving him from relapsing into it;" under the influence of this spirit, enterprise and adventure were fostered

<sup>a</sup> See Brown's "Philosophy of the Human Mind."



and encouraged with the prospect of man's best earthly reward, the approbation, esteem and affection of woman ; and when Religion (though even somewhat tainted with superstition) stepped in with her aid, the glorious crusades began, pioneering the way to vast improvements in the sciences of geography, commerce, and navigation, and all useful knowledge in general.

Such are the benefits, for which mankind in general are indebted to the noble and honorable principles which originated amongst the Christian knights and gentlemen of old. But military men especially owe them a boundless debt of gratitude. The vanquished are now no longer inhumanly and mercilessly murdered ; meanness and treachery are banished from our warfare, and our hostilities are in a great measure weeded of their chicfest horrors, the basest and worst passions of the human heart. Let not the modern soldier despise the bold cavalier of those romantic days gone by, because he cannot boast the knowledge and science which we possess ; for his was the first and most excellent quality of the soldier, honor bright. Without that guiding principle, armies cannot hold together ; discipline cannot be maintained ; valorous actions cannot be performed ; reliance and confidence cannot be placed in the troops. We should keep in view those peerless knights as models to be imitated ; there is no danger of our falling into their occasional

extravagancies ; for the cold-blooded tone of society in the present day is sufficient to correct any such tendency. But when the standard of glory droops unregarded, and the star of honor shines dim and darkly amidst our battalions, then begins our dishonour and decline. We may in truth say of glory,

“ When thy bright promise fades away,  
Our life is but a load of clay.”

## THIRD ÆRA.

COTEMPORARY with the revival of literature, great alterations and improvements began to take place in European warfare, which nearly all historians have attributed entirely to the invention of gunpowder. But this position admits of much doubt, for it can scarcely be supposed that when all the arts and sciences of the ancients came to be known again, and the study of them to be revived, the military art alone should have been forgotten. We may therefore reasonably conclude that, if that inflammable composition had never been discovered, still warfare would have undergone many improvements, and not have been left behind in the general advancement of all the arts.

There can, however, be no doubt but that the velocity and force of military projectiles having by means of gunpowder become so infinitely greater than ever were those of the ancients, the nature of modern fortification and modern tactics has consequently undergone such great changes that the features of our warfare appear to bear a very

slight resemblance to those of ancient days. In sketching, therefore, the history of this third æra in the progress of the military art, it will be advisable; in the first place, to direct our attention to the science of gunnery ; next, to fortification, over the nature of which its influence is more immediately discernible ; and lastly, we shall cursorily review the gradual improvement in general tactics since about the period of the revival of literature. The honour of the invention of gunpowder has been a subject of much dispute and contention, and many have been the fables concerning it. But the most common belief is, that it was discovered in the year 1320, by Bartholomew Swartz, a German monk. A writer in the *Encyclopedia Britannica* conjectures that Swartz having pounded the materials for it in a mortar, which he afterwards covered with a stone, a spark of fire accidentally fell into the mortar, and set the mixture on fire ; upon which the explosion blew the stone to a considerable distance. Hence it is possible that Swartz might be taught the simple method of applying it to war. The figure and name of mortar given to a species of old artillery, and their employment, which was throwing great stone bullets at an elevation, very much corroborate the conjecture.

Cannon is said to have been used as early as the year 1346, at the battle of Cressy, and by its novelty to have contributed greatly to the victory of the English ; but we have no authentic record of the

fact, and it is extremely improbable, as ordnance was not cast in England till nearly two hundred years afterwards. Besides, it is evident from history that their first use was confined to sieges, where they answered the purpose of the ancient machines, being employed in throwing large stones.

Cannons were at first made of long iron bars fitted together longitudinally and tied up with strong hoops, or of sheet iron rolled up, and fastened in a similar manner. Some were even made of wood, and Gustavus Adolphus used some small light guns made of iron hoops covered over with tough hides. The form of the first guns was somewhat similar to that of mortars in the present day, except that they were infinitely longer. They were exceedingly cumbersome and unmanageable, and the difficulty of transporting them necessarily rendered their use very limited. It was a long time before iron balls came to be projected from cannon, large stones of immense weight having been the ammunition at first used. The Turks employed guns at the siege of Constantinople in 1394, and in 1452, which threw weights of one hundred pounds ; but such ordnance could not stand a frequent repetition of firing. Cannon of this kind was of an enormous size ; and there is now, in the castle of St. Julian de Barra, near Lisbon, an extraordinary gun, bearing an inscription, which says that it was cast in the year 1400 ; its length is twenty feet seven inches ; its diameter at



the middle six feet three inches ; and it threw one hundred pounds weight. It was the custom to bestow names on pieces of ordnance, when they were first invented ; and the Spaniards and Portuguese were in the habit of calling them after their saints. Louis the Thirteenth, in 1503, caused twelve brass guns of extraordinary dimensions to be cast, and named after the twelve peers of France ; and the Emperor Charles the Fifth, preparatory to his African expedition in the year 1535, had cannon made, which he called the twelve Apostles. There is at present in Dover castle an enormous sixty-pounder called Queen Elizabeth's pocket pistol. Such a practice would be very inconvenient in the present time, when cannon are very numerous, and therefore they now always take their names from the weight of ball which they carry, the largest now in use being forty-two pounds, excepting only some of sixty-eight pounds, with which carronades are occasionally loaded.

The rudely constructed cannon at first employed was afterwards supplanted by pieces, which had smaller calibres and cast of a mixture of copper and tin, called gun metal ; they threw iron bullets instead of the stones formerly used. Ordnance of this sort was first cast in England according to <sup>a</sup> Fuller, in the reign of Henry the Eighth, in the year 1535, by

<sup>a</sup> History of the Worthies of England.

John Owen. The use of artillery becoming more general and their number increasing in all armies, iron guns were cast on the principle of economy ; but it was a long time before they came to be generally used, a supposition being entertained that they were very liable to burst if much heated by firing. Experience, however, having proved that if cast of good iron, they are as strong as brass guns, and not so liable to run in the vent, military opinion is now rather in favour of iron, than of brass ordnance. But the principles of casting ordnance were so little understood previous to the latter end of the eighteenth century, that the writers of that period affirm that the pieces then in use differed but little in shape and dimensions from those made in the time of the Emperor Charles the Fifth.

Although, as before remarked, cannon was for a long time after its first invention employed in throwing stones or balls at a considerable elevation, still we find no authentic account of shells previous to the latter end of the sixteenth century ; the first practice of them appearing to have been at the siege of Wachtendok in Guelderland, by the Earl of Mansfield, in the year 1588. About the same period the petard was invented amongst the Huguenots, and employed in the taking of Cahors, in 1579, by Henry the Fourth of France, at that time king of Navarre. It is a metal engine, of the shape of a hat, being seven inches in depth, and

five across the mouth. When applied to a gate or barrier, it will burst it open ; but of course, can only be used in case of surprise. The various descriptions of cannon formerly used, as whole and half canons, culverins and demi-culverins, falcons, and falconets, have all been gradually laid aside, and other kinds, which experiments have proved to be less faulty, have been adopted in their stead. They have been made of a lighter and more portable construction. Smaller pieces have been brought into use, and the battering guns now used are of the same size as the demi-cannons of former times. The expense and great unwieldiness of the old pieces more than counterbalanced their superior violence of impulsion. It may be doubted, however, if the impulsion was so forcible as many suppose ; for it is recorded, that a rampart of Magdebourg, in the early part of the seventeenth century, was struck by fifteen hundred and fifty cannon shots, and experienced no serious injury from them. This must have been owing to the bad kind of powder with which the pieces were charged. The old pieces being of an enormous bore and of a fabric very inferior to that of modern guns, could not endure charges of a very strong kind of powder, and, consequently, a powder reduced by grinding to the form of very fine meal was the kind used, and it was not until after the construction and material of ordnance had been

greatly improved that the corn or grained powder, now used, was adopted. The additional strength which the grained powder was found to possess, from affording to the fire a free passage through its particles, occasioned the total disuse of mealed powder. The adoption of an improved kind of powder thus contributed to the general abandonment of the old cannon of clumsy make and inconvenient weight. But there was another circumstance which tended still more to this result. In making a breach in the wall of a fortress, the old method was to commence battering in the upper part of the wall, and from thence to continue downwards. The modern practice is, in the first instance, to cut off the wall as low down as possible, and then to batter lines perpendicular to that, so as to bring down the masonry in large flakes by repeated salvos. It is then evident, that the modern battering pieces, from their superior facility and quickness of firing, must be much better calculated for such a service than the more unwieldy guns of former days.

The astonishing effect of great artillery quickly induced men to contrive different kinds of small fire-arms, and a variety of species of muskets called hand-culverins, hand-guns, hackbuts, and arquebuses, were successively invented very early in the sixteenth century. The first remarkable instance of the use of arquebuses, was at the battle



of Pavia, in the year 1525, when fifteen hundred Basque arquebusiers, under the Marquis de Pescara, are said to have contributed mainly to the victory of Charles the Fifth. Muskets were at first very heavy, and were supported on rests; they were provided with match-locks; and on the march, the soldiers carried only the rests and ammunition, having boys to bear their muskets after them. It was the Duke of Alva who first introduced the extensive use of these weapons amongst his infantry on taking the command of the Low Countries in 1567. The fame acquired by the Spanish troops caused those weapons to be soon extended over all Europe. They were, however, of very rude construction, being inlaid with ivory or bone. It was the custom, sometimes, to shoot from them small wooden arrows called sprites, which are said to have done much execution. Boxes for carrying ammunition and a lighter kind of match-lock musket, were afterwards adopted; but it was not until the middle of the seventeenth century, that rests were laid aside. Those rests were, sometimes, armed with sword blades, and being placed before the musketeers when loading, served to keep off cavalry. Many suppose, that from this circumstance, the hint was taken for the invention of bayonets, but it is more probable, that the idea was first suggested by the habit the musketeers acquired of sticking their daggers into the muzzles



of their pieces when coming to close quarters. The first bayonets, which were made at Bayonne, and were introduced into the French service in 1671, were, in fact, nothing more than daggers formed with light handles to fit into the muzzles of the muskets. They were fastened by two rings to the barrel, to allow the piece to be fired, and lastly by sockets, when fire-locks were introduced about the close of the sixteenth century. Fire-locks were introduced into the British service in the year 1686, when three regiments were armed with them, and have ever since retained the name of fusileers, from the French word fusil, signifying a firelock. The firelock, having been formerly called snaphane, it is supposed to be of Dutch origin, that being the name still given to it in their language.

The fabrication of both great and small fire-arms has been, without doubt, greatly improved within the last century ; but this, alone, would not enable us to derive so much greater advantage in the present day from the use of gunpowder, than was done immediately subsequent to the discovery of it. Our superiority in gunnery is attributable more to discussions on the theory, and experiments in the practice of projectiles than to any mechanical causes. This very important subject, involving in it many of the mathematical principles of natural philosophy, cannot be uninteresting or uninteresting ; and as it will throw much light on

the progress of the military art in general, it may not be displeasing to the reader, here to transcribe a portion of Mr. Robins's plain and popular sketch of the progress of the science of projectiles, contained in the preface to his excellent work on gunnery, published in 1742.—“The first author I have seen, who has professedly written on the flight of cannon shot, is Tartalea, a celebrated Italian mathematician, famous for having invented the method of solving cubic equations, which is usually ascribed to Carden. This author, in his ‘*Nova Scientia*,’ printed at Venice in the year 1537, and afterwards in his ‘*Quesiti et Inventioni Diversi*,’ printed at the same place in 1546, has professedly discussed several particulars relating to the theory of these motions; and though the then imperfect state of mechanics furnished him with very fallacious principles to proceed on, yet he was not altogether unsuccessful in his enquiries, for he is supposed to be the first who asserted that the greatest range of projectiles was at an elevation of  $45^{\circ}$ . He likewise determined, (contrary to the opinion of practitioners,) that no part of the track of a bullet was a right line, although, the curvature was in some cases so little as not to be attended to, he comparing it to the surface of the sea, which, though it appears to be a plane when partially considered, is yet, undoubtedly, incurvated round the centre of the earth. He also assumes to him-

self the invention of the gunner's quadrant, and has often given shrewd guesses at the event of some untried methods which were proposed to him. But as he had never been conversant in the practice of artillery, but founded his opinions on speculation, almost all writers who succeeded him were perpetually carping at him, though often without naming him, of which many examples might be given from the works of Busca, Collado, Ufano, Simieczowicz, &c. And the philosophers of those times often intervening in the questions hence arising, there were hereby many disputes on motion set on foot (especially in Italy) which continued till the time of Galileo, and perhaps gave rise to his celebrated dialogues on motion, which were first printed in the year 1638. And in this interval, or before the doctrine of Galileo was established, many theories of the motions of military projectiles, and many tables of their comparative ranges at different elevations were published; all of them egregiously fallacious and utterly irreconcilable with the motions of those bodies; although some of them were the labours of men who had spent the greatest part of their lives in employments relating to artillery. Such were the tables of Ufano, of Galens, of Ulric, &c. taken notice of by <sup>a</sup> Blondel, to which might be added many more not mentioned by that author. Indeed there have been few

<sup>a</sup> "Art de jeter les Bombes."

ancient writers on this subject (and they are a numerous sect) who have not indulged themselves in some speculations on the difference between natural, violent, and mixed motions ; although in the application of these mistaken notions scarce any two of them agreed.

But what is most strange is, that during those contests, so few of those who were entrusted with the charge of artillery, should think it worth while to examine their respective theories by proper experiments. However, thus it has happened ; for I do not remember to have met with more than four authors who have actually tried the ranges of shot and shells at different elevations. The first of these is Collado, who has given us the ranges of a falconet carrying a three-pound ball, to each point of the gunner's quadrant. But from his numbers it is manifest that the piece was not charged with its customary allotment of powder. The next is our countryman Bourne, in a treatise printed the next year after Collado. His elevations were not regulated by the points of the gunner's quadrant ; but by degrees ; and he ascertains the proportion between the ranges at different elevations, and the extent of the point-blank shot. But he has not informed us with what piece he made his trials ; though, by his proportions, I presume it must have been a small one. The other two, which have occurred to me, are Eldred and Anderson, both



Englishmen. Eldred's principles were within certain limits, near the truth. He has given us the actual ranges of different pieces of artillery at small elevations, all under ten degrees. His book is entitled 'the Gunner's Glasse,' and the experiments he relates were most of them made at Dover castle, of which place he was many years master gunner. The earliest date I find to any of his experiments is 1611, but his book was not published till 1646. His experiments are numerous, and appear to be made with great care and caution; and he has honestly set down some which were not reconcilable to his method; and on the whole seems to have taken more pains, and to have had a juster knowledge of his business than is to be found in many of his practical brethren; for they have been generally too much attached to some incorrect theory or to the common usage which they have always followed, to think of extending their art by proper experiments or indeed to conceive that it was not already complete; it would otherwise have been impossible that positions so little to be reconciled with experience should have held their ground so long as they have done, a remarkable instance of which is the doctrine which has taken place in this subject since the time of Galileo. Galileo printed his dialogues on motion in 1638, as we have already observed, and in these he has pointed out the general laws observed by nature in the production and composition of motion,



and was the first who described the action and effects of gravity on falling bodies, and on these principles, he determined that the flight of a cannon shot or of any other projectile would be in the course of a parabola, unless so far as it were diverted from that track by the resistance of the air ; and what inequalities would thence arise he has proposed the means of examining ; for he has described a method of discovering what sensible effects that resistance would produce in the motion of a bullet at some given distance from the piece."

" When Galileo had thus shewn that independent of the resistance of the air, all projectiles would in their flight describe the curve of a parabola, it might have been expected that those who came after him would have tried how far the real motions of projectiles deviated from a parabolic track, in order thence to have decided whether the resistance of the air was or was not necessary to be attended to in the determinations of gunnery. But instead of this cautious procedure, the subsequent writers on gunnery have boldly asserted (without an experimental examination) that no considerable variation could arise from the resistance of the air in the flight of shells or cannon shot, supporting themselves in this persuasion chiefly by the consideration of the extreme rarity of the air compared with the dense and ponderous composition of those projected bodies. And hence (this maxim of the inconsiderable effects

of the air's resistance to the motion of shells and bullets being continually repeated and copied by succeeding authors) it is now become an axiom almost generally acquiesced in, that the flight of these bodies is nearly in the curve of a parabola."

The series of experiments carried on by Mr. Robins from the year 1746 to 1751, has completely proved that the resistance of the air to the flight of a projectile is so very considerable as to render the parabolic theory quite inapplicable to practice ; and he has very cleverly demonstrated that such resistance is nearly in the duplicate proportion of the velocity of the resisted body. In order to determine the true degree of velocity with which balls are projected from guns with any charges of powder, he invented his celebrated ballistic pendulum, which is a large moveable block of wood oscillating freely upon a horizontal axis. This machine being at rest, a ball is discharged into it from a gun at a short distance of forty or fifty feet, and from the velocity of the pendulum, which can be easily measured, the initial velocity of the ball may be inferred according to the <sup>a</sup> laws of motion and forces. The invention of the ballistic pendulum has contributed in an incalculable degree to the improvement of the art of gunnery, and has since been employed by experimental artillerists in every civilized country in

<sup>a</sup> Consult Hutton's Mathematics, and Robins' Gunnery.

Europe ; for it has been found that the velocity of a projectile affects its range more than any other circumstance, in so much, that while the path of a ball thrown with a small velocity, as of three or four hundred feet per second, may differ little from the curve of a parabola, the path of one projected with a great velocity will not at all resemble that curve. A most interesting set of experiments were tried at Woolwich by Dr. Hutton in the years 1783, 1784, 1785, and 1786, and since that period by different skilful officers on the continent, which have thrown much light on the real motions and ranges of projectiles, and to which the artillerist must now look for data on which to practise his art. Gunnery being in itself an extensive science, it would exceed our limits to enter into a minute inspection of those experiments ; but the reader can easily imagine the advantages which the modern artillerist must derive from them and from the scientific discussions of our modern natural philosophers.

One of the greatest modern improvements in the fabrication of fire-arms is the method of making rifled barrels, which, though from various causes inapplicable to great guns, has produced the most formidable description of small fire-arms yet known. The invention was probably suggested by the observed fact, that a ball is often very much deflected from its straight course by the whirling motion on its axis acquired from the friction against the sides

of the piece. Now, it was known to every body that the feathers of an arrow were always placed in a spiral form in order to make the arrow spin around its axis without which it could not possibly move in a straight direction. In order then to make a ball revolve in this manner, on its longitudinal instead of its transverse axis, a rifled piece has its cylinder cut with a number of spiral channels ; and these are in reality female screws varying from the common screws only in this, that their threads or rifles are less deflected and approach more to the figure of a right line, it being usual for the threads with which rifle barrels are indented to take little more than one turn in their whole length. The number of these threads is various in different countries, it being a matter of little consequence, so that the spiral motion be given to the ball.

The subject of gunnery has been dwelt upon thus long, as gunpowder is now the sole *primum mobile* of all military projectiles ; and because, through its influence, the nature of fortification has been entirely changed, and the features of our present tactics have assumed a new aspect. The immense superiority of cannon over the ancient projectile machines, was very soon experienced in the attack and defence of fortified places, and after a lengthened period, its influence began to be also felt in field armies, introducing a new and now very important arm before unknown—the artillery—

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and tending to create many changes in the tactical formation both of cavalry and infantry, especially of the latter. But as this result took place at a comparatively late date, we shall, in the first instance, apply our attention to a review of its effects on the art of fortification.

The complete and total difference between the styles of ancient and modern fortification, is occasioned by the superior violence given by the force of gunpowder to modern military projectiles. The extreme height of the ancient walls was found very inconvenient and dangerous, when cannon was brought to bear upon them ; for the besiegers, by erecting their batteries at long ranges of perhaps a thousand yards, could batter with certainty of aim such a large mark as the lofty battlement afforded ; while, on the other hand, the besieged must have found it very difficult to injure at so great a distance, such low and small objects as the besieger's batteries, which were formed of earth, and consequently, were almost invulnerable by the distant fire of the place. Again, the narrow ramparts of antiquity, which answered very well for archers, were found to want space for mounting and manœuvring great guns ; and it, therefore, became necessary to increase their breadth, which was effected by building up rubbish and earth, supported in rear by a revêtement, or lining of masonry. Hence arose our modern thick ramparts, composed

of earth within the centre, and lined in front and<sup>a</sup> rear with brick or stone work. But, to give the reader a clear notion of the nature of this improvement, Figure 1, Plate 1, exhibits the sections of an ancient (A) and a modern (B) rampart. The ancient wall is entirely composed of the modern rampart of earth, supported by exterior and interior revêtements, marked by the dotted lines. It should also be observed, that the thin parapets of antiquity were easily destroyed by cannon, and, therefore, their thickness was increased to eight or ten feet of solid masonry; but it was soon discovered that the stones or bricks being knocked off in every direction by the besiegers' fire, the splinters were very dangerous to the besieged; and often even more destructive than the balls of the enemy. Earthen parapets were consequently adopted in process of time in place of those of masonry. The rampart, being thus far improved, still remained exposed by its great height to the distant batteries of the besiegers. In some degree to remedy this defect, the moat or ditch was dug deeper, and the earth from it was thrown out so as to form a mound sloping towards the country, which was called a glacis, and served (at first only very partially) to

<sup>a</sup> The interior revêtement is sometimes dispensed with for the sake of economy. The only object in it is to gain more room for buildings, &c. within the place.

cover the face of the rampart, or the scarp, as it is commonly called, from a distant cannonade ; and also to render the passage of the ditch more difficult.

But the most important addition to the profile of fortified places was the modern contrivance called a covert way ; and the various reasons which induced to its adoption, I shall now endeavour to detail. In all stages of the art of fortification, it has been an object of primary importance for the besieged to intercept or destroy the offensive works carried on by the besiegers ; and therefore sortics conducted judiciously and on a moderate scale have been always resorted to by the most able and skilful governors of fortresses. But, when fortification was in a less improved state than at present, there was always a very great difficulty in effecting a safe retreat after a sortie, through gates and bridges, which gave admission to but few men at a time ; for the rearmost of the party might be left on the edge of the counter-scarp for a long time exposed to the enemy's fire ; or if vigorously pressed might be driven into the ditch, and destroyed ; or, a bold and active enemy might even take the opportunity of rushing pell-mell with the fugitives into the body of the place. The invention of the covert-way completely obviates this danger, besides exhibiting many other advantages, for sortie parties can assemble in safety and secrecy in it, and march out from a considerable number of

debouchès or openings to the attack of the besieger's trenches ; whereas formerly these were necessarily very few in number. The covert-way was also found to afford a safe and convenient post for bodies of infantry in reserve to remain in for the purpose of covering and protecting a retreating sortie party. It presents another and most important advantage in being a work from which musketry may be employed to check the besiegers in their near approaches by a heavier and more grazing fire than could be given from the ramparts of the place. A covert-way is formed by cutting off a portion of the crown or summit of the glacis so as to make a road on the top of the counter-scarp completely sheltered by the glacis from the view of the country. Figure 2, plate 1, will enable the reader to form a clear conception of the different stages of improvement in the formation of the profiles of fortified places. A, is the section of an ancient wall with its moat or fossè ; B, the section of an improved rampart but with the old kind of ditch ; C, the same with a glacis (F) surmounting the counterscarp or outer bank of the ditch ; and D represents the profile of a work with a covert-way (G) cut in its glacis. It is obvious that with the old kind of moat the besieged derived little or no advantage from the counter-scarp, the scarp or face of the rampart being so much exposed to distant battery ; whereas the glacis protects and covers the scarp, in so much that in a well constructed modern



fortress no part (or at all events a very small portion) of the masonry of the scarp can be discovered by the besieger until he arrives on the glacis. The addition of the covert-way presents the many advantages before enumerated ; so that in the present time the taking of the covert-way and the forming of a lodgment on the crown of the counterscarp, is always the most arduous and bloody action of the siege.

But it is not in the profile merely that the appearance and style of fortified places have been so entirely altered by the influence of our formidable modern projectiles ; for their entire outline has gradually assumed a different aspect in proportion as the use of cannon became more general and better understood. For many ages the outline of a fortress continued to be nothing more than a walled enclosure of a circular, curvilinear, or right-lined polygonal form, having at intervals square or semicircular projections which afforded a kind of feeble flanking defence to the general scarp. It is also obvious that outer portions of the projections themselves (see figure 3, plate 1) were very much exposed to assault and escalade, being totally unprotected by the fire of any other work, and the ancient machicoles (before described) having of course become quite useless when cannon was brought to bear upon them. These serious defects in the ancient outline of a place gradually led to the introduction of our modern bastionary

fronts. In the first instance bastions were very simply constructed ; right or obtuse angled triangles were described upon the outer faces of the square projections (or on the chords of the outer portions of the semi-circular) so as to enable the flanks (*c c c*) to protect by their fire the faces (*d d d*); and the better to effect that object, the flanks were made to form obtuse angles with the curtain.

It is difficult to fix the exact period at which this important improvement took place, and many are the names which claim the honour of the invention of bastions. Some attribute it to Zisea, the Bohemian, who flourished in 1419, and others to Achmet Bashaw, who, after he had taken Otranto in 1480, is said to have used bastions in fortifying it. But disregarding all that is doubtful or fabulous, we may be certain that they were adopted early in the sixteenth century ; for Tartalea, in a work of his published in 1546, describes the bastions, which were then being built at Verona, and also gives a plan of Turin, which was then fortified with four of them. Bastions were originally of much <sup>a</sup> smaller dimensions than they now are, and were placed at irregular intervals according to no fixed principles, but as the discretion of the engineer suggested ; and conse-

<sup>a</sup> The Citadel of Antwerp, built under the direction of that great soldier, the Duke of Alva, in 1566, is an exception to the above statement.

quently many *dead points* or portions of the scarp totally unflanked were usually found in a fortification. This proved to be a very great evil when mines of gunpowder began to be employed ; for the besiegers could take advantage of these *dead points*, and under cover of night set a few miners to work and thereby effect a breach in the curtain. It must be observed that it was formerly the practice to assault the curtain, the flanking defences not being in those days sufficiently great to overthrow a storming party. Henry the Fourth of France was the first who employed (towards the close of the sixteenth century) mines of gunpowder in the attack of places in a remarkable and successful manner. The evil of the small bastions placed at distant and irregular intervals attracted the attention of the celebrated Count Pagan, who, in a treatise published in 1645, demonstrated that these works ought to be made larger and placed closer to each other, in order to afford every portion of the ramparts of the place a powerful flanking defence. This system forms the groundwork of the modes of construction afterwards recommended and adopted by Marshal Vauban, of which we shall speak presently.

The improvements in the profile and outline of fortresses, which I have now detailed, kept pace pretty evenly with the general progress of gunnery, and the art of attack, in so much that until the close of the seventeenth century the defensive branch of

the science of fortification appears still to have maintained its ancient superiority over the offensive. Of this there cannot be a more remarkable example than the famous siege of Candia by the Turks in 1667, 68, and 69. It was defended by Morisini, a Venetian nobleman, and it withstood fifty storms, and the mines of the besiegers were destroyed five hundred times by the Venetian counter-mines ; which great means of defence were for the first time used at this siege. It is supposed that fully one hundred thousand men were lost by the Turks in their various attacks upon this great bulwark of Christendom. It is related by M. de Bosmard that the son of the grand Vizier Koprogli, who was charged with the siege operations, sent a messenger to his father to represent the great difficulties of the undertaking. The Vizier listened patiently to the messenger of his son, and when he had ended, said, "Come close to me, but take care, your life depends on it, do not step upon the carpet, in the midst of which I am seated." This order placed the messenger in much embarrassment, till the Vizier made a sign to two slaves to roll the carpet up to his feet. "Approach now," said he to the messenger, "without fear ; this is all my answer, carry it to my son." From this his son is supposed to have taken the hint for the establishment of regular parallels as now used in sieges, which is as it were a rolling up of the carpet of the earth before the besieger. Thus this wonderful



siege is remarkable for the first adoption of two great means, the one of defence, the use of counter-mines, the other of attack, the construction of regular parallels.

About the same period in which this remarkable siege took place, there appeared, on the theatre of war in continental Europe, that great soldier, whose genius effected such important alterations in the art of fortification. It was Marshal Vauban, who first gave that decided preponderance to offensive fortification over defensive, and which has left their equilibrium to this day unrestored. He served as an engineer in a subaltern capacity at the siege of Gravelines in 1658, and at Lille in 1667; at each of which he conducted one of the attacks, and made some slight improvement upon the old routine. But when he obtained the chief direction of the siege operations at Maestricht in 1673, he then entirely abandoned the ancient method of attack, adopting the system of regular parallels, which some suppose he borrowed from the example of the Turks, who are said to have used them six years before. Formerly, when a place was invested, the besiegers chose one or more points of attack and advanced on these simply by trenches or roads of approach cut in zig-zags. (See Plate 2.) The batteries were constructed in face of those of the place which they were expected to silence, and they were generally inclosed in a fortin

or field fort, which also afforded some support to the neighbouring zig-zag or attack, as it was commonly called. The besieged, by concentrating all his fire on the narrow head of one of those attacks, generally caused much loss and delay to the besieger who was also very much exposed to danger from sorties, as his trench-guard had to run all the way from the tail of the trench to the support of the working parties. In some degree to remedy this latter evil, little boyaus or places of arms for thirty or forty musketeers were constructed at the different turns of the zig-zag. But Vauban, perceiving the complete insufficiency of such petty accessories, made (at the siege of Maestricht) one grand place of arms parallel to the general direction of the works of the place, and distant three hundred toises. In this parallel, or a little in front of it, he established his first batteries, and from hence he conducted his attacks in zig-zags, (see plate 3,) the workmen being supported by strong guards close at hand in the parallel, as well as by the disposition of the batteries. When his approaches had got within half way of the crest of the glacis, he constructed a second parallel with the same objects in view as in the first, and so on again, he protected and supported the ulterior works till he established his lodgments, and breaching batteries on the summit of the counterscarp. An inspection of the plate will give the reader a sufficiently clear idea of the

general nature of these improvements, the minute particulars of which it would be foreign to our purpose to detail. The result of them was, that Maestricht, one of the strongest of the Dutch fortresses, was taken, after thirteen days of open trenches, with comparatively trifling loss to the French.

Thus, by this establishment of a regular and well contrived system of parallels and approaches, the operations of the attack were at once rendered more certain and less dangerous than they had hitherto been. But it was not until the siege of Aeth, in 1692, that Vauban gave the great blow to the equilibrium, which had formerly existed between defensive and offensive fortification. At this siege he extended his first parallel so as to embrace a greater extent of the works of the place than formerly, and he chose the situations for his first batteries on an entirely novel principle. Instead of constructing them directly in front of the batteries of the besieged, as heretofore, he placed them on the prolongations of the lines of defence of the fortress, so as to be able to enfilade or rake those lines. They were called batteries *à ricochet*, from the new method of firing the guns which he then put in practice. In place of loading with strong charges of powder, a very small quantity is put in the piece, in order to throw the ball with little velocity. The piece is then elevated, so that the ball, in its

descent, may barely go clear of the parapet of the fortress. By these means, the angle of incidence in which the ball reaches the ground being small, and the velocity trifling, it must either bound or roll along in the direction in which it has been fired; and, therefore, the cannon on the rampart, which the recochet battering is intended to sweep, must soon be dismounted by the multiplied bounds of the shot. In the same manner, the fire of the ricochet batteries rakes the interior of the covert-way, destroying the palisades, and wounding with the splinters the troops posted there. In plate 4, the dotted lines issuing from the batteries (NN) mark the directions of the fires, which rake the terre-plein of the principal works of the place.

I have now sketched the progress of those improvements in siege operations which have been the primary causes of rendering our modern fortresses so very weak, in comparison to the means of attack. Up to the time of Vauban, fortified places continued to make the same obstinate defences for which the towns of the ancients were remarkable, and although the defenders of places in latter times, fighting against Christian and civilized enemies, have not to fear the dreadful consequences in death or slavery, the terror of which operated so powerfully in maddening the inhabitants of ancient places to resistance; still we find that military honor and discipline induce men amongst



us to fight with as much energy as the ancients did when influenced by the love of liberty, of their property, and of their families. The sudden and rapid progress made in the science of attack is, therefore, the true and primary cause of the inferiority of our defences ; but we may, perhaps, be allowed to doubt if this be the sole cause. There may be others which, although secondary, have yet had considerable influence in destroying the vigour of our defences. An able writer and experienced engineer officer, M. de Bosmard, remarks that the falling off in the defensive branch of the art dates from the time when the construction of places reached the highest state of perfection ; and he is of opinion that it may, in a great measure, be attributed to the total abandonment which has been made of the whole science of the attack and defence of places, to the engineer corps alone by the rest of the military, during more than a century back. He observes, that the defence of fortresses is usually intrusted to officers, (not engineers,) and who, perhaps, have never studied the first principles or elements of the science of fortification, esteeming it not as part of their profession, but as appertaining to the engineers only. From this he argues against the utility of having an engineer corps, although a member of that corps himself, saying, that the duties they now perform should be executed by the general staff, and urging that such a system would

necessarily introduce a more general acquaintance with fortification throughout the ranks of an army, and be productive of various other advantages, which he details at length in his "Essai General." It would be presumption in me here to hazard an opinion one way or another on so grave a point ; but I cannot avoid noticing some historical truths which have reference to the subject. Before the existence of engineer corps, it is notorious that all eminent military men, both in ancient and modern times piqued themselves on the knowledge of the attack and defence of places ; whereas now very excellent soldiers in other respects are not ashamed to confess their entire ignorance of fortification. Cæsar evidently takes great pride in the manner in which he conducted the sieges of Alesia and Marseilles, or he would not have entered so much into detail concerning them ; and the same spirit is discernible in the works of every military writer down to the close of the seventeenth century. But now, we hear of nothing but engineers informing their generals of such and such facts, as if the generals were unable to form their own opinions and plans ; so much is the study of the beautiful and sublime science of fortification neglected by the military in general in our days. Engineer corps are of very modern date ; it was in the beginning of the last century that they began to be generally organized in the different armies of

Europe. But France had had a corps of them as early as 1604, when Sully collected out of the whole army a number of officers remarkable for their knowledge of fortification, and organized them under the name “*ingenieurs ordinaires du Roi.*”

It is wonderful to reflect on the important results which have followed the apparently simple invention of ricochet firing. It may easily be imagined that, had no remedy or at least no counter-acting contrivance against this method of firing been discovered, there would be very little difficulty in taking a place by general escalade ; for, if the whole front of a fortification were so enfiladed by the ricochet batteries as to have all its guns dismounted, and its defenders routed, escalading parties might with a certainty of success descend into the ditch, and planting their ladders, crown the ramparts. But traverses<sup>a</sup> placed at intervals along a rampart or a covert-way diminish in a very considerable degree the effect of ricochet fire, because they intercept and catch the balls in their progress of hopping or rolling along, and may thus protect a gun or two, and will at all events shelter a good number of infantry. Still, however, the ricochet batteries do immense mischief to the besieged ; so that otherwise than by sorties they can rarely offer serious interruption to the approaches of the besiegers, till they arrive upon

<sup>a</sup> A Traverse is a strong parapet or breast-work of sufficient thickness to resist cannon shot.

the glacis ; and so far it is necessary for them to come to establish their breaching batteries ; for in a well constructed modern fortress, as before observed, the masonry of the scarp is entirely concealed by the glacis from a more distant view.

But notwithstanding every method as yet combined for increasing the strength of fortresses, the offensive branch of the art of fortification still retains the decided preponderance over the defensive, first given it above a century and a half ago, by the use of parallels and the invention of ricochet batteries ; and sieges are now rarely of longer duration than six or seven weeks, and are commonly conducted in four or five. Marshal Vauban himself, although he turned his great genius to the subject of defensive fortification, failed in restoring it to its former relative condition. He improved upon the system of his predecessor, Count Pagan, whose lines of defence were too long to allow the faces of the bastions to be properly defended by the musketry fire of the flanks. Vauban's first system adopted the divisions into little, mean, and great fortifications ; the first applied to the construction of citadels, the second to that of ordinary fortresses, and the third serving only for fortifying a peculiarly situated front, as on the edge of a lake, bank of a river or sea coast, its line of defence being very long. The side of the polygon in Vauban's mean fortification is 180 toises or about 360 yards ; so that the faces



of the bastions are within musket shot of the flanks. To enter into a detailed account of the minute particulars of his system would be foreign to our present purpose, and it is therefore merely necessary to observe that his system, variously modified according to the methods of different professors of fortification, has been applied to nearly all the remarkable fortresses in Europe. Cormontaigne has made considerable improvements upon Vauban, the most important of which are the increased saliency given to the angle of the demi-line, or ravelin, and the directing of the flanks of the bastions perpendicular to the prolongation of their corresponding faces.

The system of Vauban's rival and contemporary, Minno Baron of Coehorn, who was a general of artillery in the Dutch service, has been universally adopted in the United Provinces. His system displays a great deal of ingenuity in the disposition of the flank defences, and also in the arrangement of his casemated batteries, covered caponieres and crenêled galleries. It is, however, applicable solely to wet and low situations nearly on a level with the water, the author's attention having been entirely directed to what suited the soil and situation of Holland.

More authors have employed their ingenuity and talents in modern times on this branch of the military art than on any other, insomuch that a mere list of the writers on fortification would occupy a

considerable space. Within late years there have been published two interesting works on the subject, diametrically opposed to each other, the one by the celebrated M. Carnot and the other by that able officer Sir Howard Douglas. The chief feature in M. Carnot's work is his advocacy of vertical fire as a principal and effective mean in the defence of places. Sir Howard argues against Carnot's doctrine, adducing the results of experiments made by himself in proof of the inefficacy of vertical fire. On the other hand, Sir John Horsford (late commandant of the Bengal artillery) relates, in a memoir upon the defence of Fort William, that he had made several experiments, which were decidedly in favour of vertical fire. It is very difficult to come to a certain conclusion amidst such conflicting testimony, and it will probably be some time before the controversy shall be finally and satisfactorily settled.

But the modern improvements in the fortification of sea-coasts must interest islanders more than the advancement of any other branch of that art. The large and lofty castles of antiquity were found inadequate for the defence of harbours and landing places when attacked by ships armed with cannon. Low batteries of heavy ordnance were consequently applied to the defence of sea-coasts ; but being open in rear were liable to be easily taken by parties landed for the purpose from the enemy's ships ; and therefore block houses and defensible guard-houses

were established in the batteries as keeps, to which their garrisons might retreat in case of necessity. These are still used in particular and favourable situations ; but Martello towers are now generally esteemed the best defences for a line of coast. They are called Martello towers from a remarkable defeat which two British ships of war suffered in the year 1794, from a tower of this kind in Martello bay in Corsica, which was mounted with only one gun. The tower being a small and round object of strong construction, the fire of a ship agitated by the motion of the waves has very little effect upon it ; whereas the gun or guns upon the tower may be fired with such precision as to disable, in a very short time, any vessel which would venture within their range. The smallest Martello towers are thirty feet in height, and about the same in diameter at top ; they are built with two stories, the upper one being intended for the accommodation of the troops ; and the lower divided into several apartments, one serving for a powder magazine and the other for provisions and various kinds of stores. The lower story is usually covered over by light arches and the upper by a bomb-proof arch, over which there is a flat terrace entirely composed of masonry, commonly of a depth of five feet over the crown of the arch. Upon this terrace the guns are mounted and it is surrounded by a strong parapet of masonry six feet in height, with a banquette. The usual entrance to a Martello

tower is a door nearly on a level with the first floor and to which you ascend from without by a ladder capable of being removed at pleasure. Over the door is placed a Machicole, to enable the garrison to fire down or throw grenades on any assailants who might attempt to storm the door. The guns upon Martello towers are mounted on traversing platforms, that is to say, on common garrison carriages, which instead of being worked on fixed platforms, are worked on platforms moving on a central pivot. This contrivance gives the guns a more extensive command on every side than could possibly be attained upon fixed platforms. Sir William Congreve has of late years very much improved the plan of traversing platforms, and has adapted them to service in casemated ramparts with inverted embrasures, which last invention has been found to possess many advantages.

Anciently, field-fortification was most usually considered as nothing more than a mere temporary method of protecting a camp from surprise and sudden assault, and an intrenchment was generally made of a square or circular form without any regard to flanking defences. But after the invention of fire-arms, it became the custom to encamp troops upon an extensive front, with their flanks resting upon impassable objects, as lakes, rivers, inaccessible mountains, or thick forests; and to cover their front with an unbroken line of intrenchment. These field works



have commonly been constructed simply by digging a ditch and making a parapet or breast-work in rear of it with the earth dug up, and supported by a revêtement of fascines, logs of timber, turfs, &c.; but it has been a work of much greater difficulty for military engineers to decide upon the most proper figure to be given to the outline of an intrenchment. Much ingenuity and geometrical ability have been wasted in the discussion of this question, and many valuable quires of paper needlessly blotted with flanking defences, and lines of fire by the scientific gentlemen who agitated it, without ever appearing to suppose the surface of this globe to be a whit more uneven than their mathematical sheets. The simple case is that, experience and reason having proved cross-fires to be most effectual, every military officer was anxious to avail himself of that advantage as much as possible. But the nature of a country seldom allows of this being done according to fixed rules, and therefore in the field, a military man must rely on his own genius, and practical knowledge of ground to enable him to dispose a line of intrenchment judiciously.

The original intention of an intrenchment was to afford a small force some protection against a stronger, which might be opposed to it, until reinforcements could be obtained or till the enemy should be wearied out by sickness, want of ammunition and provisions, or some such cause. This object of field

works has often been greatly mistaken, and continued lines of intrenchment have been constructed along whole frontiers with the vain expectation of deriving some protection from them for the country in the rear.

But the results have always shown that the defenders of such extensive lines being spread along too wide a space, a concentrated force of the enemy could easily penetrate at any one point before the scattered corps would be collected to oppose him. Marshal de Bourg, considering this inconvenience an insuperable objection to the use of continuous lines, when he was intrusted with the defence of Alsace in 1733, ordered seventy-six redoubts to be constructed along the Rhine from Huningen to Lauterbourg. These small detached works, which were garrisoned by the militia, so far protected every point of passage in the river, that the enemy could not force the passage without experiencing some resistance, and the alarm being given in time for the different corps of the army to concentrate upon the point of the frontier attacked. Marshal Saxe demonstrated, both in his writings and practice, the superiority of detached field works over unbroken lines of intrenchment, the latter being incompatible with that fundamental axiom of military science, that extension is weakness, judicious concentration strength. The authority of Frederick the Great also, as well as that of Saxe, has been decidedly

against long and unbroken lines of intrenchment, in which (he argues) the troops, being deprived of freedom of movement by their constrained position, are liable to be divided and broken in a central part of their line, without the possibility of reforming. On the other hand, the excellence of the contrary system of field fortification, namely, the judicious disposition of detached works on commanding parts of the ground, was admirably well exemplified in Frederick's own fortified camp, which he formed at Buntzlewitz, near Schweidnitz, in 1761. The camp was surrounded entirely by numerous redoubts and other works of various figures according as the form and undulations of the soil and the nature of the country generally suggested ; and their general outline, including all windings and turnings extended nearly <sup>a</sup> eighteen miles. These works were disposed so as to afford each other mutual support by their fire, and they were garrisoned by detachments of infantry, while the debouchès between them were guarded by corps of infantry, or cavalry, when the ground admitted their action. In the centre of the chain of works was the grand reserve of the main army in readiness to come with a concentrated effort to the support of whatever portion of the chain should be most seriously assaulted. Nothing could be more beautiful or truly scientific than the well organised system of supports and reserves, which the

<sup>a</sup> See Tielke's "Field Engineer."

king of Prussia brought into play in the disposition of this celebrated camp. It may be remarked too, that it was here a most important accessory to the defence of field-works was first used on an extensive scale; I allude to the use of fougasses, or small field mines, which are made simply by diggingsquare pits commonly about twelve feet deep, and by making chambers at the bottom capable of holding as much powder as could blow up the intended areas of ground, the trains communicating with the redoubts or other field-works in front of which the fougasses may have been placed. This description of small mine has been used occasionally from the time that mines of gunpowder were first invented; but were never so extensively employed as at Buntzlewitz; and the dread of them is said to have deterred the Russian corps d' armée from attacking Frederick, although Marshal Laudon tried every argument to persuade their General Czerniechef to do so. But notwithstanding the forcible illustration of the advantages of detached redoubts, which the camp of Buntzlewitz afforded, many generals, since that time, have acted on contrary principles, either from a blind and obstinate prejudice in favour of long established notions, or from a timidity of character which makes men cling to an apparent shelter of any kind. Marshal Daun's cautionary measures when opposed to the king of Prussia in the seven years' war (which began in 1766) were the cause of



many defeats to himself, and have introduced into the Austrian service the pernicious practice of the war of position, or the occupation of strong and fortified tracts of country, with no other apparent object than that of maintaining their ground. It is to be expected, however, that the excellent precept and glorious practice of their Arch-Duke Charles has now cured them of this egregious error; as all the other armies of Europe have abandoned the use of continuous lines of fortified intrenchments during the whole of the late wars.

But the most remarkable and most glorious example of the advantages to be derived from a well-disposed chain of redoubts or other natural obstacles, was furnished by the Duke of Wellington, in 1810. His celebrated <sup>a</sup> lines of Torres Vedras were planned and constructed on the best principles of field fortification, and played a most important part in the sublime combinations by which with very inadequate means he delivered the Peninsula from the dominion of France. They stretched completely across the Peninsula of Lisbon from the Tagus to the sea, blocking up every approach to the city and covering a considerable tract of country in their rear. Independently of the works thrown up about the Fort of St. Julian to

<sup>a</sup> When lines are spoken of, we are not to understand merely continuous lines of enclosed intrenchments, but in many instances the term is applied to a chain of works, which perhaps would be the more proper phrase to use generally.

cover an embarkation in case the British should be forced to such a measure, there were two grand chains of works in front of Lisbon. The outer or advanced chain was traced from the mouth of the little river Zizandra over the mountains of Torres Vedras and Monte-Agraça to Alhandra on the river. Torres Vedras and Monte-Agraça were the two grand keys of the position, and were fortified accordingly with such care as to be converted into petty fortresses, the little fort and two dependant redoubts at the former place mounting forty pieces of cannon. The extent, of this line, following its contour throughout, was twenty-nine miles. The second line was of less extent, measuring twenty-two miles, stretching from Via Longa on the Tagus to the mouth of the St. Lorenzo, and occupying the mountain passes of Mafra, Montechique, and Bucellas, through which run three of the four great Lisbon roads. This chain was guarded by sixty-nine redoubts, mounting 272 pieces of cannon, and requiring more than 17,000 men for their garrisons; while the advanced line, besides the forts of Torres Vedras, and Monte-Agraça, included sixty-five redoubts and other works, mounting 319 guns and requiring for garrisons 18,000 men. These garrisons consisted chiefly of the Portuguese militia and *ordinença*; while the regular British and Portuguese troops were cantoned in such situations that they could speedily concentrate in force on any threatened point.

Although the lines were very extensive, yet, the Duke's army was not too much scattered, as one might at first sight suppose ; for not only were there most excellent and numerous roads of lateral communication throughout, but orders could be dispatched by means of the telegraphs from one extremity of the lines to the other in a few minutes ; besides, Montejunto, stretching out fifteen miles in front, was impassable by artillery, and the ridge of Barregudo connecting it with the centre of the lines was so rugged that no part of the enemy's force could cross it without much delay, and without being exposed to view from the lines. Hence, it is plain, that the French could not concentrate for a serious effort on any point without the allies having full time to be in readiness to oppose it.

I should be glad to enter more into detail concerning those ever-to-be-remembered lines ; but to do so would be to write a treatise, and, indeed, one of the best kind, on field fortification, and would exceed the purpose of this work. The reader may form some idea of the manner in which art and nature were made to combine for the purpose of defence, from Colonel Jones's account of one particular portion of the advance chain ; " From the right of the mountain of Alhandra, two miles of front were as a field position rendered strong to excess ; for along the face of the mountain, near its summit, a scarp, almost perpendicular, from

fifteen to eighteen feet in depth, was cut or blasted, every part of which was closely flanked by a covered musketry fire, and generally flanked by artillery secured in enclosed works, constructed on the salient points of heights, all these flanking works being seen and plunged into by large redoubts situated on commanding interior peaks of the mountain." This principle was observed, wherever applicable, throughout the whole of the two great chains ; and on the right of the second chain at Via Longa, where there were no high mountains to convert into fortified posts, the houses, vineyards, and hedges were made use of. No fanciful or pedantic rules were observed in the disposition of the various works ; the nature of the ground guided the trace and suggested the points of defence to be seized upon. And, indeed, a minute and detailed<sup>a</sup> description of those lines with good plans, would afford a student more really valuable instruction in practical field fortification than nine tenths of the treatises which have been written on the subject. In the words of Colonel Jones, " the artificial defences of the lines, altogether present a most favourable example of the just application

<sup>a</sup> The reader who is desirous of further acquaintance with this subject, should seek for the " Memoranda of the Lines of Torres Vedras," by Colonel Jones, printed for private circulation, and which it is much to be desired the able and gallant author will soon give to the world at large.



of the engineer's art in furtherance of, but invariably subservient to tactics, creating pivots and supports, but never a tie or a restraint on field movements."

Marshal Saxe may be said to have been the creator of a species of fortification, which some writers have classed under the name of provisional, as a third grand division of the art, but it is, in fact, only a compound of the two established divisions, being of such a nature as to oblige the enemy to open trenches, although not capable of withstanding a regular and protracted siege. What are called provisional forts have been found most useful in the European Colonies in Africa and America, where timber being in great abundance, strong works could be constructed of that material with facility and cheapness, and of sufficient strength to resist not only the attacks of the natives but even of European enemies, if not very well supplied with battering ordnance. Old walled towns which have a ditch and covert-way, or other works hastily thrown up to render them proof against a coup-de-main, belong to this species of fortification, and have often been found of great importance. The Arch-Duke Charles, in enumerating the errors of the Austrian government, preparatory to the campaign of 1799, notices their not having rendered strong by provisional works, the towns situated on the base of his operations, and which should have covered his retreat in case of reverse.

He remarks that the pedantry of their military schools taught them to believe all forts incapable of resisting a regular siege to be useless, forgetting the immense means which such an undertaking on the part of an enemy requires, and how difficult it is for him to employ those means till a victory has put it in his power ; and when he has not those means in readiness to be brought into play, it may be the cause of great delay and impediment to him to be stopped by places which, without being perfect fortresses, still possess such defensive advantages, as will oblige him to undertake the labour of breaking ground against them.

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THE history of tactics up to the period of the invention of fire-arms, has been already sufficiently dwelt upon. In commencing the third section of this work, I have hazarded a doubt of the truth of a very common belief, that the revival and gradual improvement of tactics during the last three centuries is entirely owing to the use of gunpowder. We have already seen, that even so early as 1422, a great reformation in the organization of the troops was effected by the then king of France, Charles the Seventh, and this at a period when cannon was scarcely used except at sieges, and a full century

before small arms became at all common. The first stage in the progress of tactics, namely, raising the character of the infantry, was already commenced, and this period received its most decided stamp from the battles of Granson and Morat, fought in 1476. In these actions, Charles the Rash, Duke of Burgundy, at the head of the finest chivalry of the time, was completely defeated by the compact and impenetrable array of Swiss pikemen. All the attempts of his gallant and well-armed gendarmerie to break the close order of these sturdy mountaineers with their formidable pikes proved futile. From this epoch we must date the transition from the confused and tumultuous *melée* of the cavaliers of olden time to a more tactical formation and more regular order of battle. Now this event took place fifty years before small fire-arms were generally used, and we may, therefore, reasonably infer, that the revival of the science of tactics received its first impulsion, not merely from the accidental discovery of gunpowder but from the same causes which brought on the revival of every other kind of science and of literature in general.

Louis the Eleventh of France now took into pay a levy of Swiss, whose renown was every day increasing, and his example was speedily followed by Maximilian of Austria ; and the Swiss masses were for a considerable time regarded as the best models of infantry. Their discipline and tactics, however,

appear to have been very simple, being based entirely on the plan of the Greeian phalanx, and the chiefest excellence of their mode of array being its impenetrability by eavalry. So much importance was attached to closeness of formation, that, by the rules of their service, death was the punishment for any pikeman who, by stepping aside in action, should open the ranks of the phalanx. To this point, indeed, it appears that their chief attention was directed; for, in other respects, the conduct of the Swiss mereenaries was so very insolent and mutinous, that the princees who employed them became anxious to take into service other troops similarly trained. The first soldiers who imitated the discipline of the Swiss were the German lanzknechts or pikemen, and they were speedily hired by different states as a kind of set-off against the turbulent spirit of the Swiss.

In the year 1494, Charles the Eighth of France passed into Italy with a small army to support his claim to the kingdom of Naples, and the greater portion of his infantry was composed of Swiss and German lanzknechts. It may be remarked, by the way, that with his army first appeared in the field a considerable quantity of artillery, and which was in those days considered an enormous train, viz. thirty-six pieeces of large brass eannon, the use of which in action must have been very limited, together with some light eulverins and falconets, which latter were, in truth, the field ordnanee. This invasion



of Italy by Charles brought on those wars of the early part of the sixteenth century, during which, such great improvements in tactics took place.

Italy was the theatre on which the French with their Swiss and German mercenary foot, were so long opposed to the Spaniards and Imperialists. In 1495, the Grand Captain Gonsalvo de Cordova disembarked from Sicily with six hundred men-at-arms and five thousand native Spanish infantry. But at that period they were unable, although commanded by the Great Gonsalvo himself, to cope with the Swiss and German foot in the French service; and a remarkable instance of their inferiority occurred at Eboli, where the Spanish foot fighting with the greatest devotion, found it impossible to shake the firm and close array of the Swiss mountaineers. The case, however, was entirely altered when Gonsalvo, returning to Italy in 1501, with a small army of twelve hundred horse and eight thousand foot, commenced that glorious career which elevated the Spanish nation to the first military rank in Europe. Many causes induced this superiority, and first, the great genius of Gonsalvo and the abilities of his officers, Pietro Navarra, Pescara, and others, who were afterwards his successors in command. It is also supposed, that the Spanish formation was an imitation of the Roman Legion, and the arms of their infantry having been originally the sword and buckler,

certain writers of that time very naturally compared them to the Romans, and the Swiss and Germans to the Greeks ; and the former comparison has the greater force from the fact, that the Latin classics were then more studied in Spain than elsewhere. But reverting to the subject of pikes, there is reason to believe that Gonsalvo, on his second Neapolitan expedition, had, to say the least, a certain portion of infantry armed with them, and we know from Bernan Diaz, that the larger portion of <sup>a</sup> Cortez' foot were pikemen, so that the weapon could not have been uncommon among the Spaniards. Others, again, attribute the excellency of the Spanish infantry to the superiority of their fire. They were, in truth, the first nation that made much use of small fire-arms ; but it is not till 1522, that we find the arquebusiers employed in a decisive manner, and by the heaviness of their fire creating disorder and death in the close ranks of the Swiss phalanx at the battle of Bicocca. And, again, three years afterwards, the defeat of Francis the First at Pavia, was mainly owing to the manœuvres and steady firing of 1,500 Basque arquebusiers, under the command of the Marquis de Pescara, who had, himself, trained them. It is related by the historian Brantôme, that these

<sup>a</sup> He landed in Mexico, and began his wonderful conquest in 1519.

arquebusiers fought in extended order. It is most probable, too, that during the whole of the sixteenth century the arquebusiers moved in loose skirmishing order ; for the annalists of those days always speak of the skirmish lasting such and such a length of time, reckoning the battle as begun only when the masses of pikemen and bands of gendarmerie came in contact.

The successes of the Spanish foot, and particularly at Bicocca, where their superiority to the Swiss was incontestably proved, soon caused the different European powers to perceive the possibility of forming good infantry of other materials besides Swiss and German mercenaries. Francis the First, in 1533, formed seven legions of French infantry, each six thousand strong, the first being raised in Picardy, and which subsisted under the name of the Regiment of Picardy until the revolution in 1789, when it was the oldest embodied corps in Europe. It is most probable, that these legions of Francis were organized on the Spanish model ; for, about eighteen years previously, he engaged <sup>a</sup> Pietro Navarra, then a prisoner of his, to train a levy of ten thousand Basque infantry according to their system. This hypothesis is further supported by the Roman name of legion, and by their division into bands from three to four

<sup>a</sup> He was taken prisoner at the battle of Ravenna in 1512, and after two years of irksome captivity entered the French service.

hundred strong, which was the Spanish mode of organization, as appears by the military ordinances of the Emperor Charles the Fifth, written about the middle of the sixteenth century.

The formation and discipline of the infantry went on improving during this century. The imperial military ordinances, just alluded to, directed that there should be two hundred arquebusiers, one hundred pikes, fifty halberds, and fifty supernumeraries in every band of four hundred Spanish foot. This regulation was first carried into full effect by the Duke of Alva, when he took command of the Low Countries in 1567; and the muskets themselves, as before observed, were at the same time made more manageable than the old arquebuses, which are said to have taken a quarter of an hour in the loading. The example of the Spanish tactics naturally attracted the notice of the Dutch; but they were still slow in the march of improvement when Prince Maurice of Nassau effected a great revolution in the discipline of their army. This prince, who was made captain-general of the United Provinces in 1584, when only eighteen years of age, established a system of drill and evolution, from which many of the military practices of the surrounding nations were derived, and which, with certain modifications, subsisted for a whole century.

But while the infantry was increasing in value



and in reputation, the old gendarmerie was fast sinking into disrepute. The nobility of France enrolled with avidity in the new legions of infantry created by Francis the First ; and this caused the service of the cavaliers or men-at-arms to be neglected and gradually to degenerate, inso-much, that the French afterwards took into their pay corps of German cavalry distinguished by the name of Reuters, who were much esteemed as skirmishers. As soon as the gendarmerie ceased to be composed entirely of gentlemen, they were no longer a militia force, as formerly, but became part of the regular standing armies and received pay. Hence arose a circumstance, tending, in no small degree, to the decline of this branch of service ; which, although it may appear trivial to the ordinary reader, will be felt in its full importance by the cavalry soldier. The horses of the men-at-arms were continually suffering from sore backs, on account of the great weight of the riders and their armour, and a few short marches rendered them unfit for service, an inconvenience not experienced by the old cavaliers, who could afford to keep hackneys to ride on their common marches and reserve their battle steeds for the day of action. In consequence of this very serious evil, to which the horses of the heavy cavalry were subject, the armour of the men was gradually lessened, the greaves, armplates, &c. were abandoned

together with the whole of the horse armour ; so that, at last, the new gendarmerie bore not the least resemblance to the chivalry of the feudal times. It should, however, be borne in recollection, that it was only in respect to excellence, as individual cavalry soldiers, that this degeneracy took place ; for the true principles of the tactics of that arm were not at all understood either by the knights of old or their immediate successors on the great theatre of European warfare ; nor, indeed, did a correct knowledge of this important branch of the service become at all common till the time of Frederick the Great.

It was towards the close of the sixteenth century, that arquebusiers were first mounted on horseback, and they afterwards got the name of dragons (corrupted in English into dragoons) from their promptitude of movement, their intrepidity, and their spitting fire, as it were, like dragons from their arquebuses. In the beginning, they fought on foot as well as on horseback, not in regularly formed squadrons, but in several small parties formed in such a manner, that when they gave their fire they passed to the rear of the file to reload their pieces. Duhesme relates, that two hundred of these dragoons saved the life of Henry the Fourth on the retreat from Aumale, by dismounting and defending the bridge ; and by this action they got into considerable repute. They

were not, however, formed into regular regiments until the reign of Louis the Thirteenth, between the years 1600 and 1643. At the same time too, the Basque light-horse, called carabines, whom I mentioned in the second section of this work, were formed into regular corps.

The early part of the seventeenth century saw Spinola with his Spaniards in the Low Countries opposed to Prince Maurice of Nassau, then a veteran. But these campaigns were more instructive in the warfare of sieges and affairs of post than in grand tactics. The thirty years' war, which began in 1618, is, however, replete with matter deserving the attentive study of every soldier. The battles of Leipsig and Leutzen are memorable proofs of the great genius of Gustavus Adolphus. He, it was, that first arranged his order of battle, with intervals equal to their fronts between his battalions, which were small and organized in three grand divisions; the centre composed of pikemen, and the flank divisions of musketeers drawn up four deep, the two first ranks to fire and the two rear to reserve theirs. The battalions of his second line faced the intervals of the first line, forming what is called the order *en echiquiers*, or chequered order. The Duke de Rohan, a contemporary of Gustavus, in praising this order of battle, observes, that it was in attacking with intervals that the Romans subdued so large a portion of

the known world, and defeated the phalanx of the Greeks, and in the same manner the small and flexible battalions of Gustavus Adolphus overthrew the large masses of Tilly and Walstein. But much as the military art is indebted to the great Swedish monarch for important improvements in tactics, and for the revival of the science of strategy, still, even he appears to have shared in the general ignorance of the times, with respect to the true nature and essence of cavalry; for his was accustomed to manœuvre and attack at no quicker pace than a trot, and they appear to have relied principally upon their fire-arms. Gustavus, too, was in the habit of intermingling platoons of infantry musketeers with the cavalry, in imitation of Cæsar's disposition of part of his troops at Pharsalia. This arrangement was copied even by Turenne, forty years later than Gustavus, and only serves to prove the backward state in which the cavalry service then was; for nothing could more effectually constrain the efforts of horse, whose strength and efficiency depends entirely on rapidity of movement, than thus tying them down to the slow rate of movement of the infantry.

Although the campaigns of Turenne and Montecuculi, in 1674 and 1675, tended greatly to develop the science of strategy or grand military operations, yet we cannot but observe that the minor details of the tactical formation of the troops still remained



much in the same state as in the earlier part of the century. Notwithstanding Gustavus of Sweden having reduced the depth of his musketeers to four ranks, we still find other nations continuing to form theirs six deep. But perhaps we have hardly a right to call this a fault, considering the clumsy fabrication of their muskets. Monticuculi, arguing in favour of the formation in six deep, says that "with less than six ranks the front could not reload by the time the rear had given their volley, and thus a constant fire could not be maintained." From this we may easily infer how slow and unsustained the fire of musketry must have been in those days. They were consequently obliged to manœuvre in such a manner as to permit each rank to give its fire successively. Monticuculi explains how this was performed. "In the wings of musketeers," says he, "by which the pikemen are flanked, the ranks fire one after the other, which may be done in two ways ; for having given their discharge, the front ranks can either pass to the rear of the others by a counter-march, or kneel to reload, keeping their noses to the ground until those who are behind them and standing have fired over their heads."

We are informed by Captain Suasso, in his work on the theory of infantry movements, that the Dutch system of drill and discipline, the foundation of which was laid by Prince Maurice of Nassau, still

continued to be generally esteemed throughout Europe up to the close of the seventeenth century. Viscount Townshend mentions that Louis the Fourteenth, in 1662, employed M. Martinet to regulate and discipline his infantry after the Dutch manner ; he was first lieutenant-colonel and afterwards colonel of the regiment Du Roi, or the King's own regiment, which was then the pattern. He was killed at the siege of Doseburg in 1672 ; his name is become among our military gentlemen a term of sneer and reproach, too often applied to such officers as shame the rest of their corps, by being more assiduous and exact in the performance of their duty than suits the levity of the young, or the indolence of the old ones." About this period also, when, as before observed, bayonets and firelocks were introduced, different nations began to form whole battalions of fusileers, and this paved the way for the innovation recommended by Marshal Vauban, whose influence with Louis the Fourteenth obtained a royal ordinance entirely abolishing the use of pikes in the French army, and substituting the firelock and bayonet throughout. This example was followed in other countries ; and the Prince of Anhalt-Dessau having invented and substituted iron ramrods in place of the old wooden ones, the fire of the infantry soldier of course became more rapid, when he got rid of what was before a great incumbrance.

This same Prince also much improved the minor details of the evolutions, and trained his infantry to an established regulated pace.

There are not wanting military men, even in the present day, who regret the total abolition of the pike ; but whatever may be the arguments on this point, the authority of the great name of Napoleon must be of weight, and he says that the ingenuity of man could never invent a better weapon for the foot soldier than the firelock and bayonet.

After the universal adoption of the bayonet and firelock, the ranks of the infantry still continued to be formed six deep ; but as cannon came to be multiplied with armies in the field, the depth was reduced to four ranks, in order that the troops might suffer less from the fire of the artillery. However, so strong was the old prejudice in favour of deep formation, that even so late as 1740, in the war of the Spanish succession, we occasionally find the infantry formed six deep ; but whether in six or in four ranks, their evolutions were, in comparison to those practised in the present day, slow and complicated. The French battalions were heavy and unwieldy, being composed of thirteen companies of fusileers and one of grenadiers, and they had a very large portion of officers whose spirit of enterprize and bravery was expected to make amends for the deficiency of military spirit amongst the private soldiers. In some corps the officers in the supernu-

merary rank were accustomed to be mounted, and (so wretched was the moral constitution of their army at this period) the <sup>a</sup> avowed object in so doing was, that they might not be borne away in flight by their men, as had often been the case with officers on foot. In order of battle the files and ranks had distances of three or four feet between them, and the men dressed or aligned themselves by their shoulders; in firing, the men of the front rank, as soon as they gave their discharge, retired by the left, through the interval to the tail of the file, there to reload. Without entering further into the detail of their evolutions, the military reader will readily conceive how difficult the performance of the least manœuvre must have been, and how confused and disorderly such a system of firing, if in presence of an enemy. It may appear surprising that greater improvements were not effected in tactics at a time when such men as Eugene and Marlborough flourished, but this may be accounted for in more ways than one. In the first place, these great men, and after them Marshal Saxe, were perhaps too much occupied with the higher and more sublime study of strategy to afford time for the minor details of tactics; and again men of talent became disgusted with the study by the vain and impertinent preten-

<sup>a</sup> See *Dictionnaire Militaire Portatif*, published in the reign of Louis the Fifteenth.



sions of ignorant professors of the drill who never stopped at any <sup>a</sup> absurdity either in writing or practice. Although the military art is considerably indebted to Folard (whose works appeared before the middle of the last century), still his fruitless advocacy of the deep formation in column, the possibility of which is precluded by our artillery fire, rather retarded the progress of improvement in the tactical organization of troops than otherwise.

It may be of advantage here to remark on the moral constitution of the French army at this period. The Duke of Argyle, in a speech made in the House of Lords in 1740, says that "the common soldiers of the French army are a mean, spiritless despicable herd, fit only to drudge as pioneers, to raise intrenchments and to dig mines ; but without courage to face an enemy or to proceed with vigour in the face of danger." The truth of this assertion is corroborated by the French authority, before quoted, and by the acknowledged fact that the foreign corps in their service (principally Irish and Swiss) were always more esteemed by their generals than the native troops, as is exemplified by Marshal Saxe's reliance on the Irish brigades at Quesnoy and Fontenoy. There is no occasion to enter into the causes of this degradation of the French soldiery ; for they are

<sup>a</sup> See preface, Suasso's "Theory of Infantry Movements."

well known, but it should be cherished in remembrance that in those days when their armies were led by the most high spirited, most noble, and accomplished gentlemen in Christendom, they did not attain to anything like so high a reputation as has since been earned by other French armies infinitely worse officered, but amongst whom an excellent moral organization has been introduced, which holds forth promise of honour and reward to the good soldier, which elevates his character and teaches him to take pride in his glorious vocation.

The tactical arrangement of the cavalry at this period was even in a more backward state than that of the infantry. They were drilled to nearly the same evolutions as the latter, were formed three deep, and attacked at a trot ; their chief reliance being on their fire-arms. A French<sup>a</sup> work, "*Essai sur le science de la Guerre*," published in 1751, asserts that the orderly advance of a single squadron in gallop is next to impossible, and argues on the danger of thus rapidly moving a longer line in presence of an enemy. Marshal Saxe, however, entertained very different ideas about the manner of attacking with this arm, as did also Charles the Twelfth, who is occasionally represented as overturning the enemy's horse by attacking them in full

<sup>a</sup> See preface, Suasso's "Theory of Infantry Movements."

gallop. In 1734 too, at the battle of Guastella, there was an instance of a charge in gallop, by the French cavalry under the Duke de Chatillon, who ordered them to advance at a trot till very near the Austrian horse, when they rapidly rushed forward and overthrew the Germans, who remained at the halt, awaiting their onset.

Hitherto, although there had been of course irregular partizan corps, there were no established light troops except dragoons, who were employed for rapidly seizing on heights and other advantageous posts, in the defence and occupation of which a portion of them usually dismounted. But about the year 1740, corps of Austrian light infantry came into repute, under the different denominations of croats, yagers, and free battalions. The croats being accustomed to a mountainous country, required but little training to become good light infantry, and throughout the wars they have proved themselves to be most formidable and harassing enemies. The origin of light infantry in the British service was during the war in America in 1756, when the generals finding that, from the difficult and intersected nature of the country, regular battalions were exposed to be much harassed on their march, selected the most intelligent and enterprising officers and the most active privates to form bands which were called rangers. The service of the rangers having been found of great utility, gave rise to the formation of

a <sup>a</sup> light company in every battalion, and which has ever since been continued in the service.

We shall pause no longer in considering the tactics of the early part of the last century ; but turn our attention at once to the revolution wrought in the art of war by the great Frederick of Prussia. The excellent tactical arrangement introduced by him both into his infantry and cavalry put an end to all fantastical discussions amongst speculative tacticians concerning cohorts, phalanxes, rhombs and wedges ; and caused the formation of troops in battalions to triumph, and to be generally adopted in the armies of Europe. The Prussian system of evolutions became the model, and the steadiness and precision of the Prussians were objects of universal admiration. Frederick effected the great improvement (in minor arrangement) of reducing the depth of his infantry to three ranks, and the general principles of his evolutions were pretty much the same as those upon which our infantry now move. His dispositions for action were most masterly ; his troops

<sup>a</sup> Napoleon says that there is and can be but one sort of infantry amongst the moderns, and that every battalion should be equally trained to light movements as to the manœuvres of the line. This is a great authority in opposition to the system of having separate corps of light infantry. Although there are some light battalions in the British service, yet His Majesty's regulations require that all the infantry should be drilled to extended movements and formations ; but these orders are seldom paid any attention to.



being so arranged that he could attack the weakest point of the enemy's line with superior force, while the rest of his troops were kept in check by demonstrations. This object he commonly effected by means of an oblique order of attack, which I before suggested that he most probably copied from the example of Epaminondas at Leuctra and Mantinea. Such an oblique attack is formed by disposing the front of the troops in such a manner that on their coming in contact with the flank of the enemy, their front should form an oblique angle with his front, as in figure 2, plate 5. It is obvious that the force B, although inferior in number to the force A, has brought a superior body of men upon his left flank, and can carry it upon every portion of his line successively. It was by attacking in this order that Frederick gained many of his victories, and especially those of Rosbach and Leuthen.

The order of march which the great Frederick used, to establish his army obliquely upon a flank of the enemy, was extremely simple, but not the less sublime in its conception, and it bore a very strong resemblance to that adopted by Hamilcar, when he attacked the revolted mercenaries under Spendius, as I remarked in the first section of this work. At <sup>a</sup> Leuthen, Frederick defeated above eighty thousand Austrians with only thirty thousand Prussians,

<sup>a</sup> This battle was fought on the 5th of December, 1757.

having attacked them by the oblique order. His army moved forward in four open columns, having a strong advanced guard considerably in front ; the first or right column being composed of the two lines of cavalry of the right wing, (excepting some detachments with the advanced guard) ; the second column consisted of the two lines of the right wing of the infantry ; the third column was formed of the left wing of the infantry, and the fourth of the left wing of the cavalry, both in two lines. The Prussian advanced guard, after carrying the village of Borna, found itself in front of the right of the Austrian position. The king then reconnoitred the enemy, and observing his right to be strongly covered by a wood and marsh, resolved to direct his efforts against the left. But the Austrian outposts having been driven in upon the right, Count Luchesi, who commanded that wing, conceiving that he would be seriously attacked, solicited reinforcements from Marshal Daun, and as the Marshal could not discover the movements of the Prussians, who were concealed by some heights, he at last marched with the reserve to his right. The king of Prussia now caused his four columns to change direction obliquely to the right by a simple wheel of each division successively ; so that the four columns were thus converted into two long open columns, the one consisting of the first line, the other of the second, and in this order he continued to move, till he found himself beyond

the Austrian left flank, when a simple wheel into line by divisions and squadrons placed his army in that commanding oblique position represented by figure 2, plate 5. An inspection of the 5th plate will sufficiently explain the general principle of this simple and beautiful order of march.

Exactly one month before the battle of Leuthen, the king of Prussia, with twenty-five thousand troops, defeated fifty thousand French and Germans, commanded by the Prince de Soubise at Rosbach, in a somewhat similar manner. The armies were encamped in directions nearly parallel to each other, and the Prince de Soubise, thinking to take the Prussians in flank and rear, caused the combined troops to move off in three columns to their right, and taking a wide circuit, to advance towards the rear of the Prussian left. But Frederick, perceiving the intention of their movement, ordered his army to retire in an open column from the left in a direction perpendicular to their former front. Their march was concealed by inequalities of the ground, and having prolonged beyond the enemy's columns they quickly wheeled into line, and thus the Prince de Soubise, imagining that he was attacking the Prussians in flank, suddenly found forty-three squadrons and six battalions on the heads of his own three columns, with a strong battery placed on a knoll enfilading his astounded troops. In vain did he endeavour to deploy his army on the heads of the

columns; the only two regiments (Swiss corps) which did form being cut up by the cavalry of Seydlitz; so that he was forced to retreat precipitately with the loss of 800 killed, 4000 prisoners, and 72 guns; while 300 killed and wounded was the only loss of the conquerors.

There cannot be more convincing proofs of the immense advantages of the oblique order of attack than the two battles now quoted; and the preparatory order of march adopted by Frederick, is worthy of our greatest admiration. The Baron de Jomini, in discussing this order of march, declares his belief that it was one of the principal causes of the great facility with which Frederick moved such large masses of men, carried them briskly upon the extremity of an enemy's line, left them in column or formed into line with the rapidity of lightning; and he argues that this cause, apparently so trifling, was one of those which contributed to his surprising successes. But it is singular enough that notwithstanding Tempelhoff's clear and distinct account of his grand and simple tactics, few of the foreign military men of that period seized on the true causes of the king of Prussia's unvarying superiority; namely, his well combined strategical operations, his system of presenting concentrated masses to isolated corps, and his skilfully directed marches and attacks. The majority of Frederick's critics imagined that they discovered the causes of his greatness in the



system of manual exercise practised by his soldiers, in the celerity of their fire, their manner of marching the oblique step, or (ridiculous as it may appear) even in the cut of their clothing. This leads me to notice another and very common mistake, namely, the supposition that, in the organization of his army, Frederick's entire attention was devoted to the infantry alone. To him, and his celebrated General Seydlitz, we owe the whole of the modern improvements in European cavalry. They formed squadrons possessing a superior degree of elasticity to any before known, and instructed in manœuvres applicable to actual service. They were taught to manœuvre and charge in full gallop, to rely chiefly on their swords, and avoid the practice of incessantly firing their carbines, which had hitherto been the usual custom. This new system was put in practice most effectually in 1745, at Soor, where the Austrian cavalry was busily occupied in firing their carbines on the advancing Prussians, but were overthrown and dispersed by a charge in full gallop, before they had even time to unsheath their swords. Warnery's description of the system of evolution practised by the Prussian cavalry shews that it was based on the principle of successive and vigorous charges, and aptly employed reserves ; the same as was exhibited three hundred years before, by Timour, on the grandest scale, and which must always be the leading

feature in the tactical instruction of good and efficient cavalry.

But the king of Prussia's attention was never confined to one or two branches of his profession merely ; his great mind embraced every subject. On ascending the throne he found himself, like Philip of Macedon, surrounded by powerful enemies, and was therefore obliged to draw on all the resources of his mighty genius, and therein he found no deficiency. Amongst his improvements in military organization, he not only reformed both infantry and cavalry ; but it was he who first regularly established (in 1759) a corps of horse artillery, a species of force, whose services have since proved so highly important in our later campaigns.

It is now sixty years since the conclusion of the famous seven years' war, from the experience of which the military art has gained so much ; and although, since that time, numberless improvements have taken place in all the minor details of military organization, and in the practice of evolutions, still, there are many, who doubt if the higher branches of the art did not, under Frederick, attain their highest perfection ; again, there are others, who condemn his practice (which was almost invariable) of attacking in line and resorting so much to line firing. They contend in favour of the system (adopted in the early campaigns of the French revolution) of forming in great heavy columns of

attack covered by swarms of sharp-shooters, and supported by brisk cannonades, previous to the general advance. This system, doubtlessly, succeeded for a certain length of time; but let us briefly consider the causes which led to its first adoption and its popularity. When the French republic found itself menaced by so many enemies, it was without a regular army, the greater part of the officers having emigrated, excepting (and luckily for the existence of the French as a nation) those of the artillery. Now, in order that battalions may move, fire, and attack in line, there is a high degree of training requisite, and this it was impossible to give to the raw levies of the French, who were, of necessity, hurried into the field. The old soldiers of the regular army formed the nucleus upon which the new corps of light infantry were formed, and as the conscripts were at this period filled with all the enthusiasm of the first outbursting of the revolution, they were zealous in learning their duty and devoted in the performance of it. The light infantry corps soon became excellent skirmishers and sharp-shooters, and being generally very superior in number to their enemies, the impetuosity with which they were accustomed to drive in the out-posts, and to commence the attack, usually caused such wavering and indecision in the hostile line, as to afford the French columns the opportunity of breaking and overthrowing them.

But victories gained by this mode of attack, always cost much blood, the heavy columns invariably suffering severely from the fire of the enemy's artillery. And it must be borne in mind, that the Austrians, in their first campaigns against the French republic, pursued that old vicious system of extending themselves in long lines in certain fixed positions, and were, therefore, easily beaten. Besides, for many years in the commencement of the late wars, we do not find a single man of talent in command of the German armies, except the Arch-Duke Charles, and even his movements were cramped by the control and absurd interference of the Aulic council; while, on the other hand, the French system of promotion engendering, calling forth, and encouraging talent, placed the cleverest men in the service in situations where their abilities were brought most into play. However, with respect to the revolutionary tactics, which have been by some so highly extolled, it should be remembered, that as soon as the French troops began to acquire sufficient instruction to be able to manœuvre in lines, the system alluded to was gradually discontinued, and they moved in columns and in lines according as circumstances, and the nature of the ground required.

But, before proceeding further on this part of our subject, it would be inexcusable to neglect mentioning one very important arm, which was



brought to such great perfection by the French in 1792, as to contribute greatly to their victories. M. de Narbonne, the then minister of war, called together a select committee of artillery officers to discuss the propriety of establishing a corps of horse artillery on an extensive footing, and to arrange the details of its organization. Their report asserted, that a "numerous horse artillery, well served and always kept complete in men and horses, is the surest method of protecting the evolutions of a corps tolerably trained, by supporting its attack with the bayonet, and rendering almost nugatory, by positions taken opportunely, and with celerity, the advantage that troops better disciplined might promise themselves from their superiority in manœuvring." The truth of this statement of M. de Narbonne's committee was fully demonstrated in the campaigns in Belgium, where the horse artillery was found to be a most powerful auxiliary to inexperienced and badly drilled infantry and cavalry, such as the French at that period. All the officers, too, of the artillery became ambitious of serving in the new corps, and an union of zeal and talent soon rendered it most efficient. At first, the ordnance was eight pounders and six-inch howitzers; but in the time of Napoleon, six pounders and five one half inch howitzers came into use. The British horse artillery is also composed exclusively of the same weight of ordnance as the French, and in the

late war it was surpassed by none in the perfection of its material and the excellence of its practice.

The tactical arrangement and organization of troops have, in the present day, arrived to a great degree of excellence, and the student must seek for an acquaintance with their various details in the regulations of the different European armies and in the numerous and able <sup>a</sup> treatises, lately published and based on the experience of the great wars, which have been carried on within the last forty years. There are still, of course, many differences of opinion amongst military men on various questions; and the heat and violence with which one point in particular, namely, the advantage of line or of column formation for attack is discussed, is very much to be deplored. On these and all other military subjects we should look with great deference to the opinions and practice of the two great soldiers of our own age, Wellington and Napoleon. We will find in their great battles that the formation in lines of contiguous columns in open order, prepared for deployment, covered by skirmishers, and supported by the fire of artillery, was most commonly resorted to for the purpose of

<sup>a</sup> The English language, so long barren in military works, at length possesses the excellent book of Captain Suasso, on the "Theory of Infantry Movements," and there is also Major Beamish's able translation of Von Bismarch on Cavalry Tactics.

attack ; but these columns were always rapidly deployed whenever the fire of artillery was apprehended. Napoleon says, that “were the second line to be placed eighty or one hundred toises from the first, and to remain formed in column during the battle, it would be destroyed by the enemy’s batteries faster than the first line ;” and his own experience at Borodino proved the truth of this ; for a single Westphalian brigade, placed in column in the second line, lost there five hundred men in ten minutes. Napoleon argues, that there can be no invariable order of battle amongst the moderns ; that the line is the proper order in some cases, the column in others ; that the genius and discretion of the commander, the nature of the ground, and other incidental circumstances, can alone determine those points.

It would be unnecessary here to enlarge on the system of tactical and moral organization introduced by Napoleon into his armies. The whole particulars are set forth and detailed in the official *Cours d’ Administration Militaire*, published by the war minister in 1811, and the general principles of the system are amply developed in his own memoirs, dictated to Count Montholon at St. Helena. These principles are founded purely on the experience of fourteen campaigns conducted by this great soldier himself, and are, therefore, entitled to be received by us with deep respect, as

well as on account of the able reasoning by which they are supported. It is worthy of remark, that he did not rely merely on love of country or of glory for influencing his soldiers, although no man ever better knew the art of electrifying his people and firing them with enthusiasm than he did. Admitting the use of such incitements, he, however, observes, that "a good general, good officers, and a judicious organization, able instructions, good and severe discipline, make good troops independently of the cause for which they fought."

But impressed, as every military man must be, with the vast importance of having the troops well trained and expert in their manœuvring, of having them supplied with good arms, food, and clothing, and diffusing a high spirit of military honor and discipline amongst them; still, he cannot but feel how nugatory all these advantages may prove to be, if the army be not led by a chief whose mind embraces the sublime principles of the science of the general-in-chief, and whose active genius is capable of deploying them in critical movements of danger and difficulty. Of what avail was the indomitable courage and super-excellent discipline of the legions of Marcus Crassus, when the ignorance and blindness of their general, leading them into the vast and parched-up sands of Mesopotamia, gave them over to be starved, harassed, and destroyed by numerous, but contemptible, Parthian marauders?



Of what avail was the admirable discipline, the high spirit, patriotism, and valour of the Prussian battalions, when the incapacity of their leaders threw them into the talons of the eagle of France at Jena? "It was not," says Napoleon, "the Roman army that subdued Gaul, but Cæsar himself; nor was it the Carthaginian army that made the Republic tremble at the gates of Rome, but Hannibal himself; neither was it the Macedonian army which reached the Indus, but Alexander; it was not the French army which carried the war to the Weser and the Inn, but Turenne; nor was it the Prussian army which, for seven years, defended Prussia against the three greatest powers of Europe, it was Frederick the Great."

This leads me to notice the subject of strategy, or the science of the general-in-chief. This sublime science has existed from the most remote periods; it is an egregious error, into which some modern military writers have fallen, to suppose that it has been produced by the invention of gunpowder, or by the numerical superiority of our armies requiring greater attention to magazines and bases of operation than was necessary amongst the ancients. It is impossible to read Cæsar's account of his own wars, without observing how much care and attention he bestowed upon the secure establishment of his magazines and depôts. It is equally impossible to read the campaigns of

the great captains of antiquity, without deriving therefrom important lessons in the science of grand strategical combinations. Yet, those writers to whom I have alluded, appear to date the rise of this, the most important and highest branch of the military profession, to the period when the Maréchal de Luxembourg led into the field the large armies of Louis the Fourteenth, which, from their great numbers, it required, say they, peculiar skill to supply with provisions and ammunition, and to establish magazines and bases of operation. In this, they not only forget the campaigns of the Roman generals, but also, the bold and well combined marches of Gustavus Adolphus on the Vistula, the Rhine, and Danube, with an army scarce thirty thousand strong, as well as the memorable manœuvres and marches of Turenne and Montecuculi. It is incontestable, that the strategical combinations of Frederick of Prussia exhibited more depth and fertility of genius than did those of his predecessors; and it must also be acknowledged, that he, again, was excelled by Napoleon and Wellington; but then, this does not, in the least, tend to prove the newness of the science of strategy. We merely have found in latter days, chiefs whose mighty genius has enabled them to make more striking and decisive application of the principles of the science, than most of their predecessors had done.

It would be vain and presumptuous, as well as

misplaced, to attempt to give any sketch of the general principles of this noble science. They are best studied in the histories of the wars of the great captains, ancient and modern; and the student will, perhaps, nowhere find a more able, clear, and intelligible exposition of the fundamental principles of the higher tactics and strategy, than in the Baron de Jomini's "*Traité des Grandes Operations Militaires*," which is, in fact, an elaborate and critical history of some of the most instructive campaigns of modern times. There cannot be a more useful and fascinating study for the officer, than such histories; for, although, he may never be called to high command, an acquaintance with the higher branches of the military profession will always enable him to execute with more readiness and confidence tasks of inferior importance. It is vain, however, to expect that this or any other study will make a person a general who is not born to be one, no more than reading Milton, Shakespeare, or Byron, will make a man a poet. Well chosen military studies will, doubtless, render a man of tolerable ability a good staff officer, a good chief of battalion, of brigade, or even of division, but not a general-in-chief. Here, again, the reader will not be displeased if I quote our great military authority, Napoleon. "*Les généraux en chef sont guidés par leur propre expérience, ou par leur génie. La tactique, les évolutions, la*

science de l'ingenieur, et de l'artilleur peuvent s'apprendre dans des traités á peu près comme la géométrie, mais la connaissance des hautes parties de la guerre ne s'aquiert que par l'experience et par l'etude de l'histoire des guerres et des batailles des grands capitaines. Apprend on dans la grammaire á composer un chant de l'Iliade, une tragédie de Corneille ?”

THE END.



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PLATE I.

Fig. 1

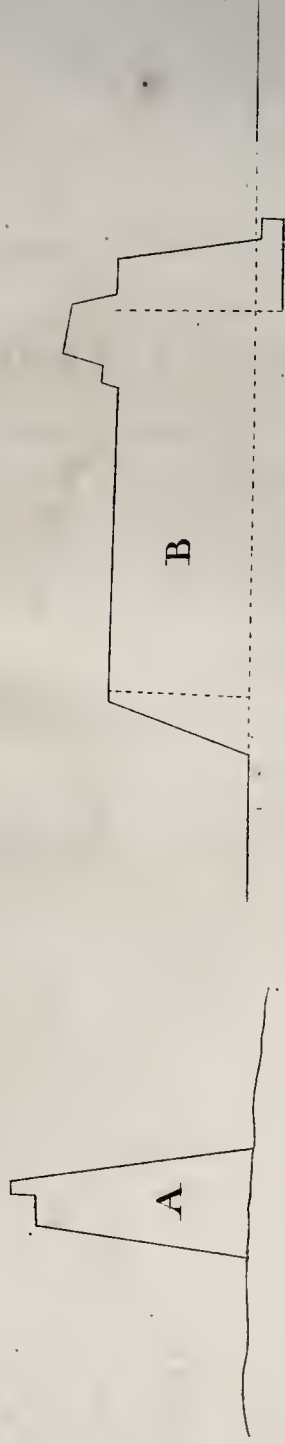


Fig 2.

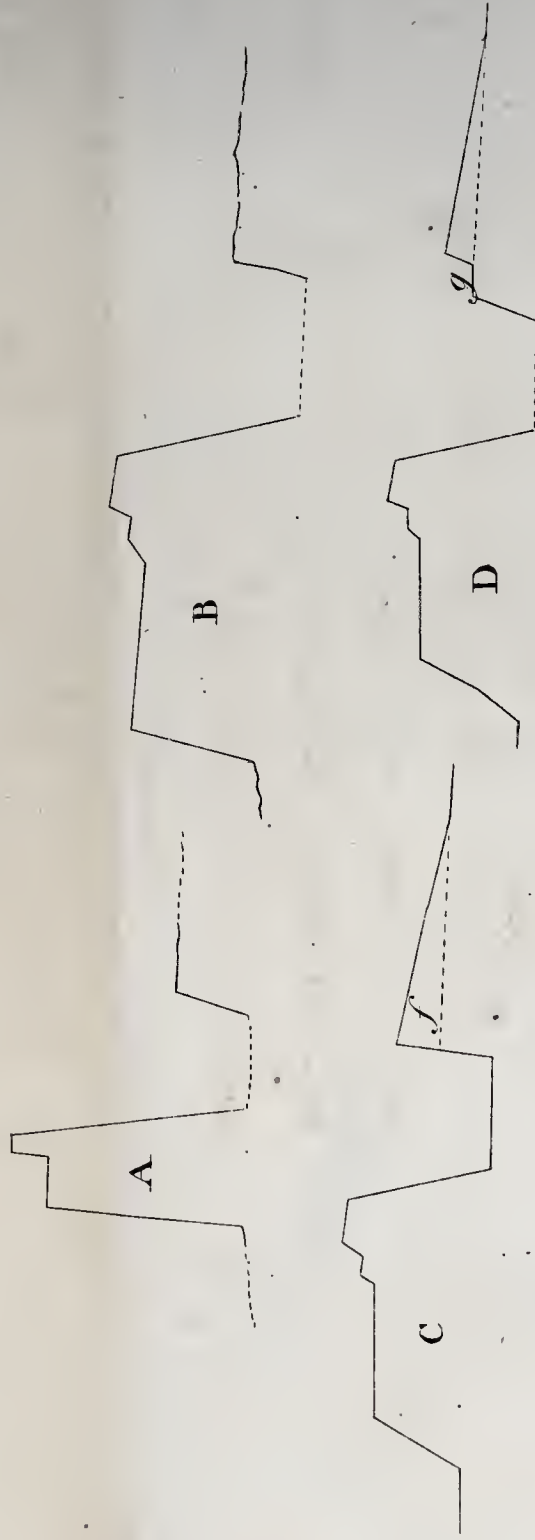


Fig. 3.

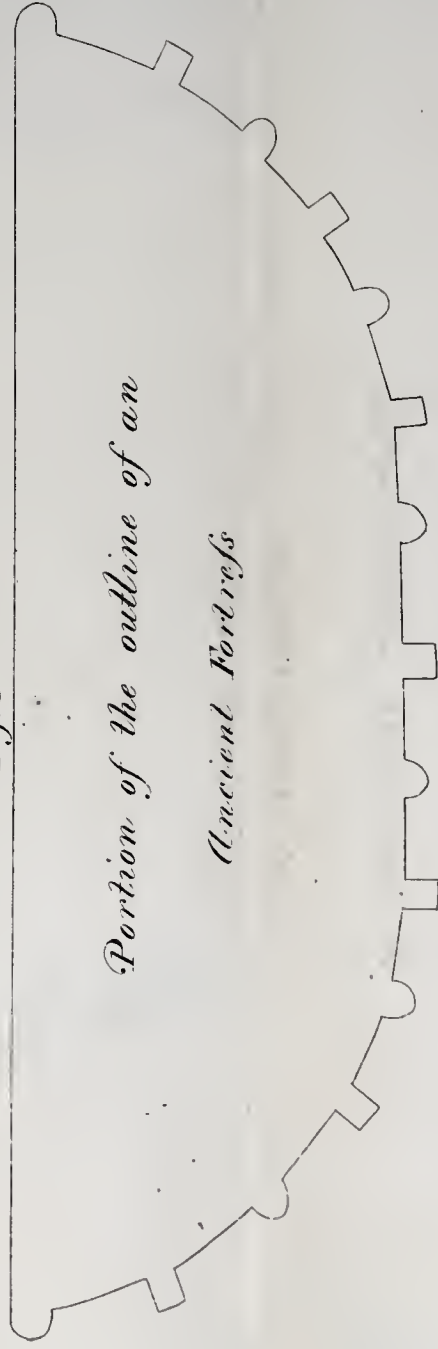


Fig4.

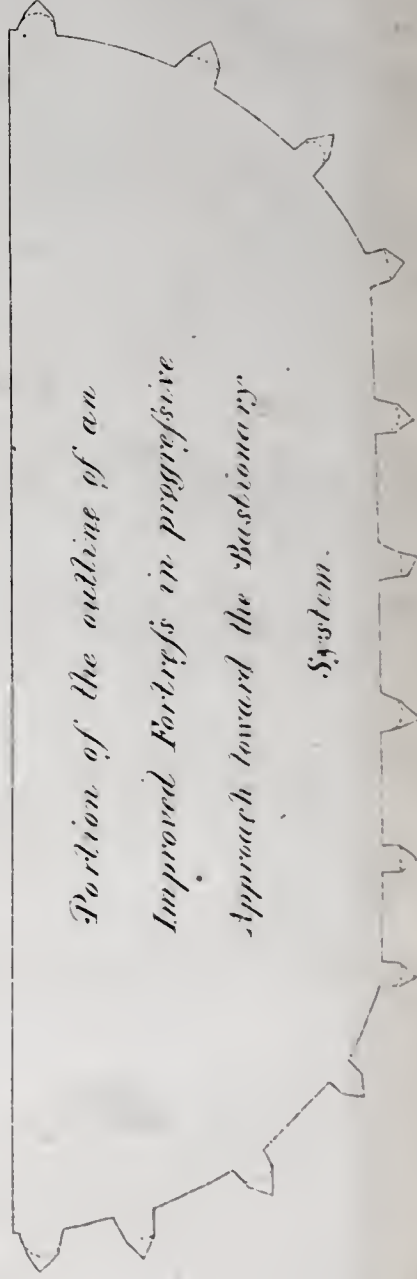




PLATE 2.

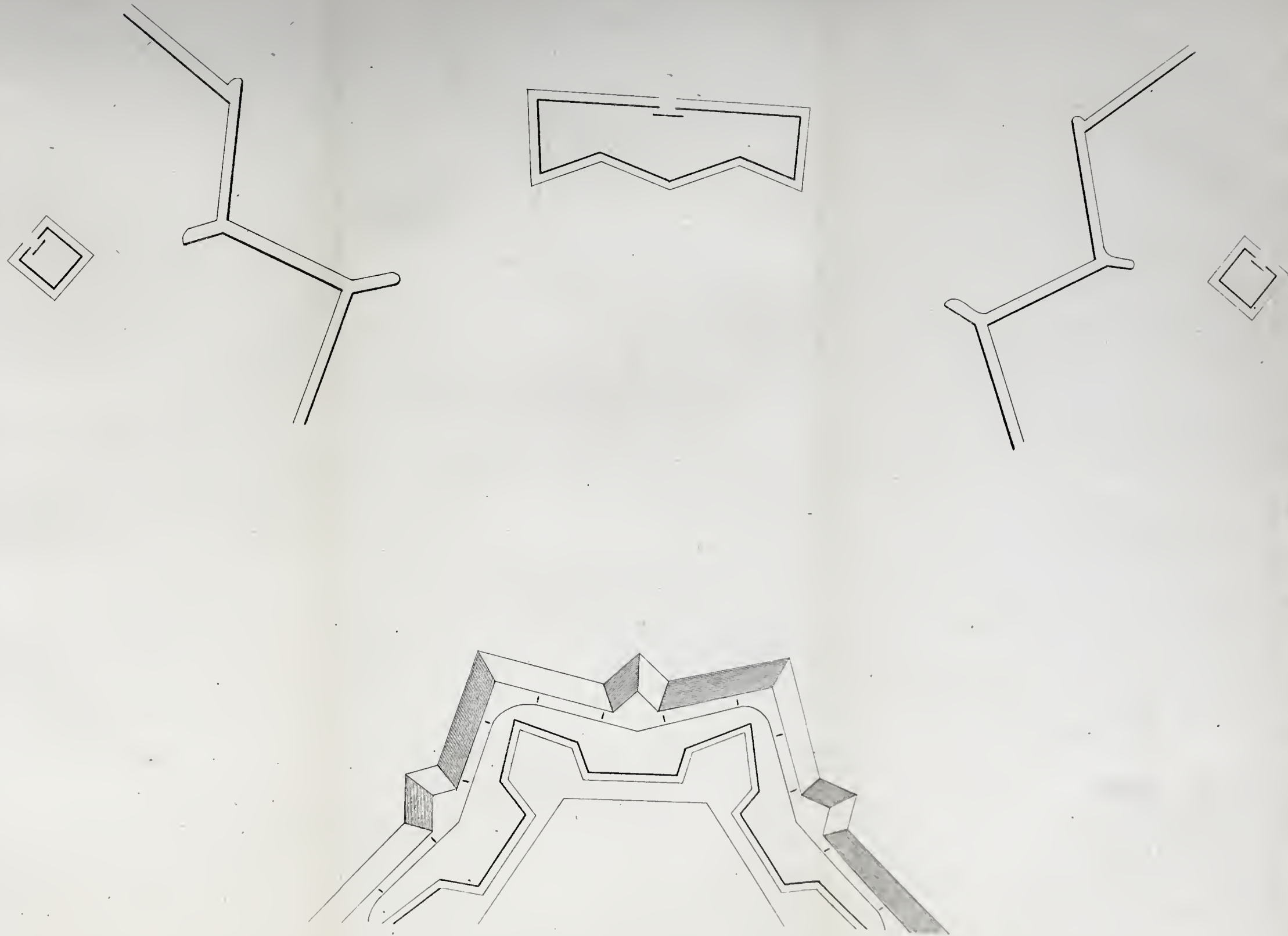


PLATE 5.

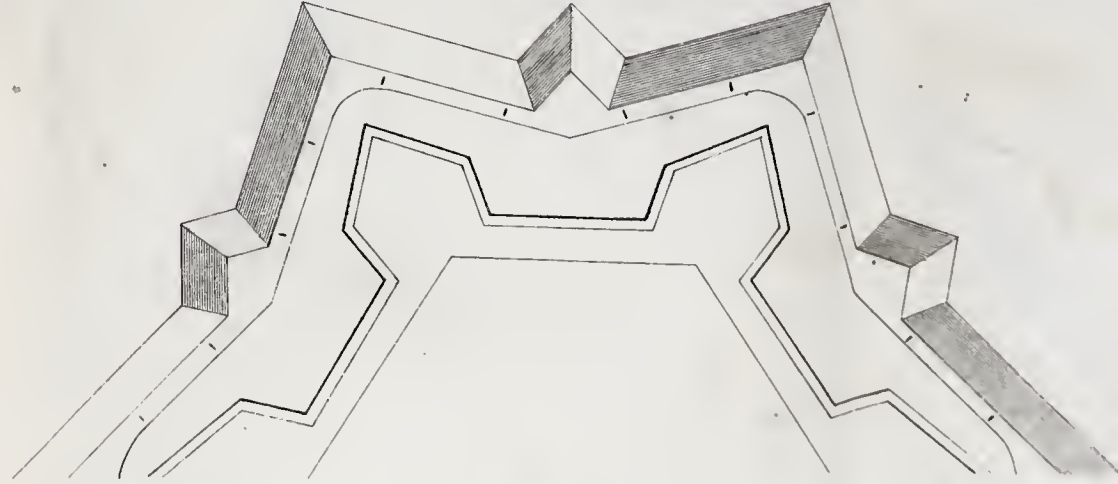
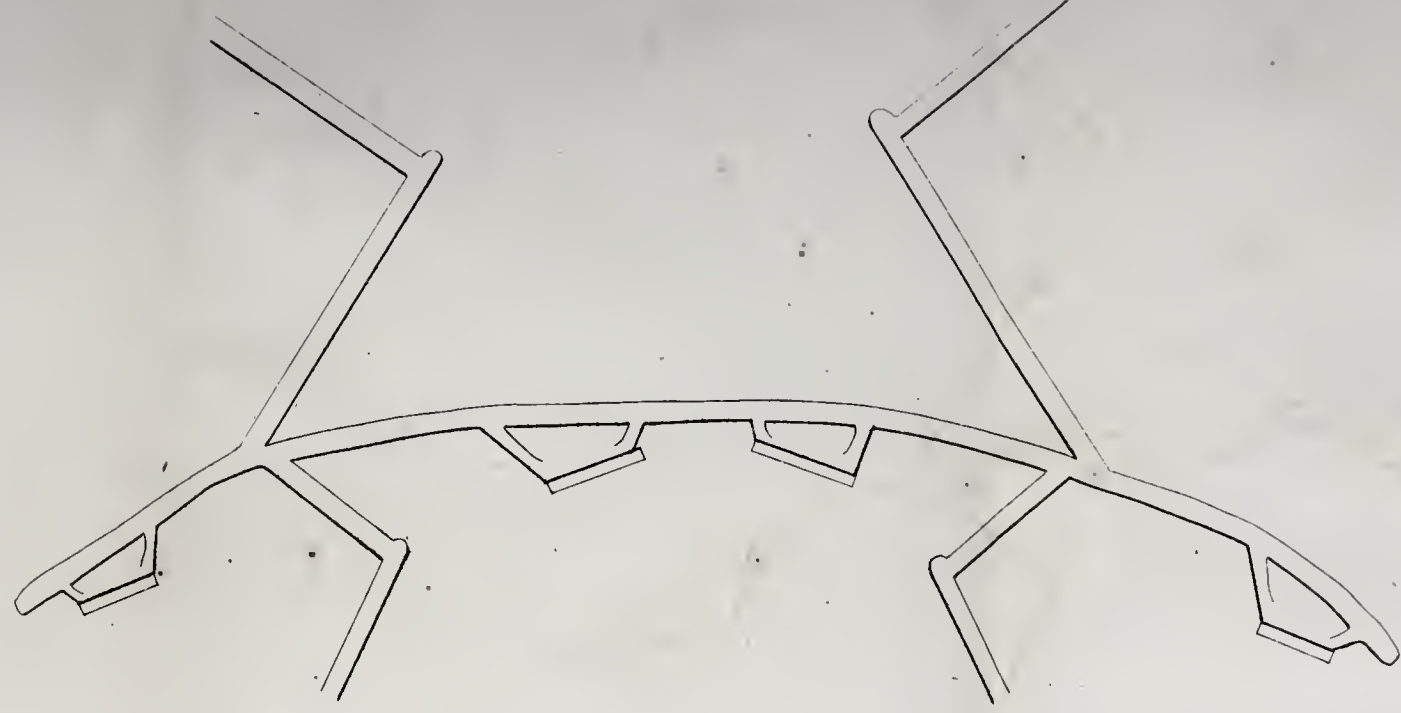
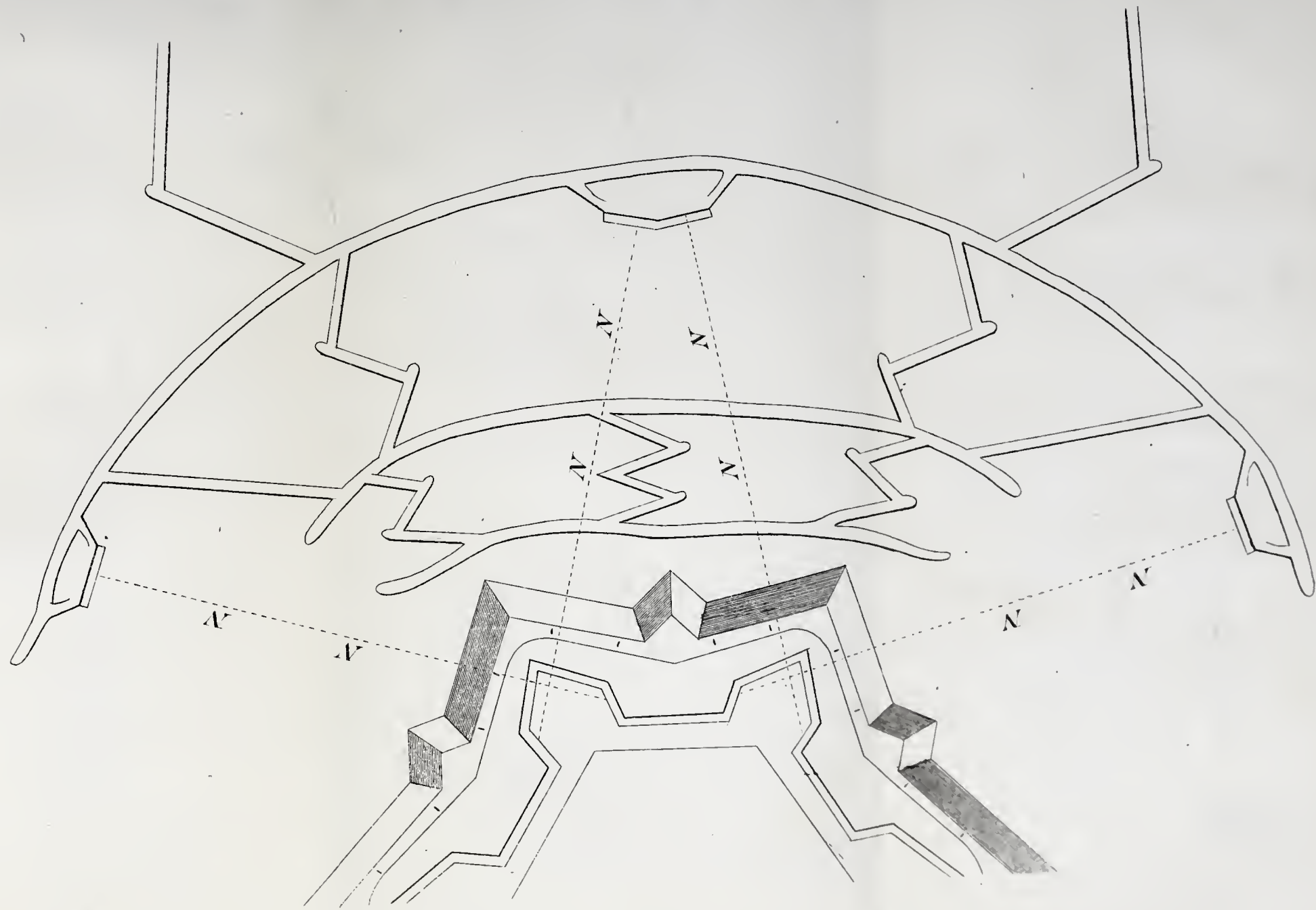


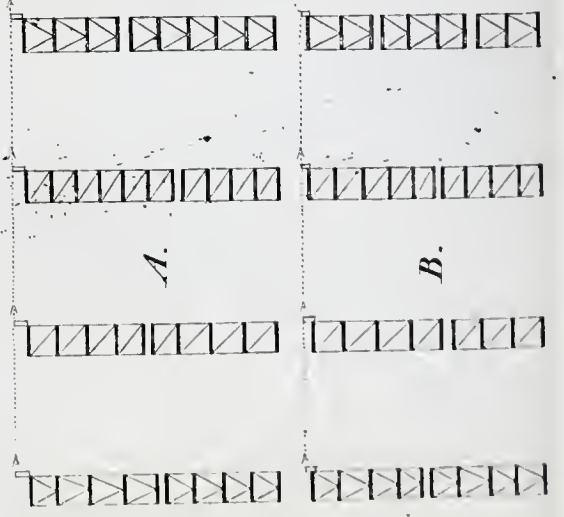
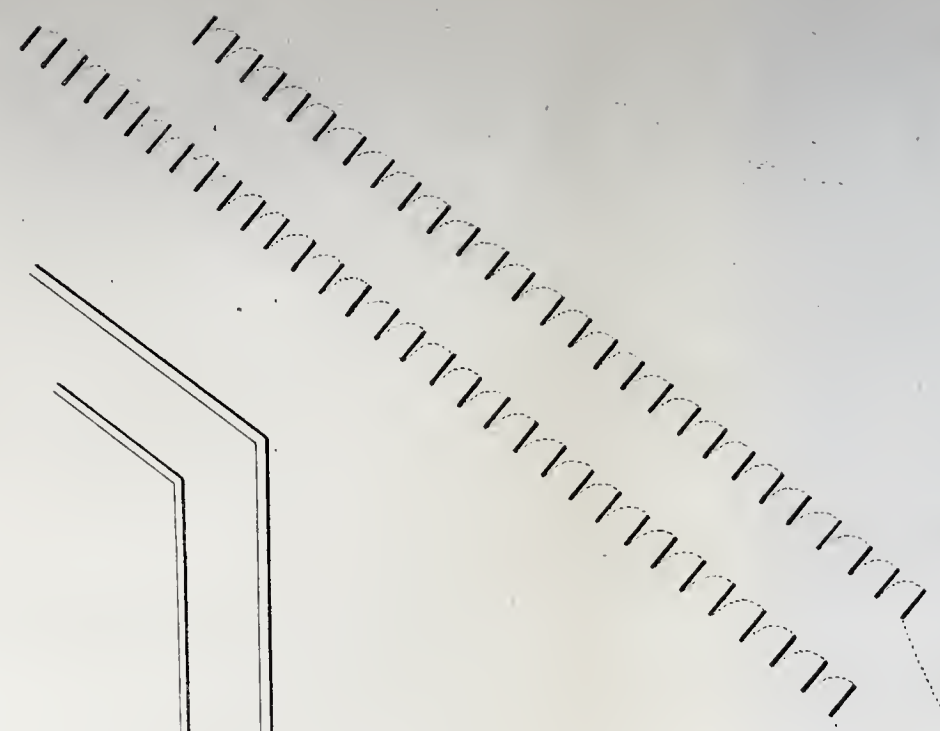
PLATE 4.



# PLATE 5.

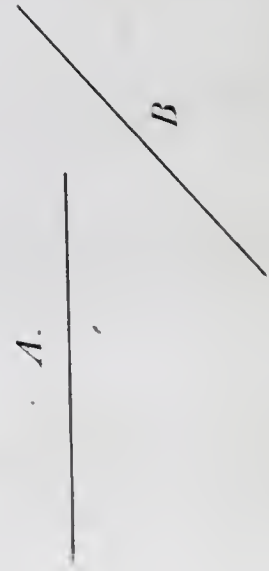
Fig: 1<sup>st</sup>

*Austrians posted in two lines*



*A- First line in four columns  
changing ground to the right simply  
by the successive wheel of divisions,  
moves in one column  
B- Second line; d.<sup>to</sup> d.<sup>to</sup>  
C Advance Guard  
AB- The Prussians moved in  
open column of platoons.*

FIG: 2<sup>nd</sup>







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